

to the apical fifth and irregularly oval spots between the fifth vein and the posterior margin, one on each side of the branch, these being yellowish. Halteres yellowish. Legs mostly a brilliant orange yellow, the femora and tibiæ black-banded apically; claws long, stout, curved at the distal fourth, simple, the pulvilli rudimentary. Genitalia: basal clasp segment moderately long, stout; terminal clasp segment long, stout, smooth, except for a swollen setose area at the external angles on the basal fourth; dorsal and ventral plates apparently missing. Harpes fused to form a chitinized, spinose tube surrounding the style.

Female.—Length 4 mm. Antennæ extending to the third abdominal segment, sparsely haired, pale yellowish or yellowish orange, distally red; 14 segments, the fifth with a stem $\frac{1}{4}$ the length of the cylindric basal enlargement, which latter has a length three times its diameter, bears low circumfili near the basal fourth and apically, and a scattering, broad whorl of moderately long setæ near the distal third; terminal segment slightly reduced, with a length three times its diameter and apically a stout, tapering process about half the length of the basal enlargement. Ovipositor short, tapering, the terminal lobes narrowly lanceolate, with a length three times the width and sparsely setose. Other characters practically as in the male. Type Cecid a2386.

A SYNOPSIS OF THE DIPTEROUS GROUPS AGROMYZINÆ, MILICHIINÆ, OCHTHIPHILINÆ AND GEOMYZINÆ.¹

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There need be no apology offered for the issuance of the following paper. Our species have been neglected; many of the commonest forms remain unidentified; there is no adequate tabulation of the species or even of the genera, and the determination, therefore, of a species necessitates laborious searching among scattered descriptions; furthermore, a surprising number of European species occur also in America. Although based almost entirely on my own collection, and therefore necessarily far from a complete treatment, this contribution brings to light so many species new to America as to justify its ap-

¹ Contribution from the Zoölogical Laboratory of the State College of Washington.

pearance in print. It will at least serve to unify our present knowledge of this series of important groups.

The species discussed in this paper are those grouped in the Agromyzidæ and Geomyzidæ of Williston's Manual. These small flies belong to that division of the Acalyptrate Muscidæ where the auxiliary vein is more or less rudimentary, ending, together with the first longitudinal vein, distinctly before the middle of the wing; the basal cells small and manifesting a tendency toward becoming incomplete, but the anal cell almost always formed, although never produced. The head is spherical or hemispherical, conical only in *Selachops*; is schizometopic, which means that the frontal orbits are continuous with the facial orbits and with the genæ; the orbital bristles descend to below the middle of the front; the center of the face is usually depressed below the level of the orbits, and is not large nor arched, protuberant only in *Sinophthalmus*; the arista is rarely loosely and long plumose, is usually quite bare, but ranges to long-pubescent or even plumose; the scutellum has protuberances only in *Rhodesiella*; the posthumeral bristle is regularly absent; the legs are never greatly lengthened and very rarely thickened; the tarsi are always slender, with the metatarsus the longest joint. The oral vibrissæ may be present or absent, the wings may be pictured or not, the body may be stout or rather slender; the color may be dark or light, and the proboscis may be long or short. The vestiture may consist of a dense pruinosity or the insect may be highly polished, while the body may have many or few bristles, or may be clothed with hairs.

While the limits of the combined group here discussed are relatively easily fixed, there being but few genera that have been questioned,¹ it has not proved so easy to define the boundaries of the subfamilies within the group. Various writers have reassigned doubtful genera here and there, as will be seen in their discussion at the close of this introduction.

Hendel and Czerny, recognizing the importance in phylogeny of hidden characters that have not been influenced by the mode of life of the species, have proposed the most satisfactory outlines of the subfamily limits, emphasizing such apparently trivial but ancestral char-

¹ *Siligo* Aldrich was described as a Helomyzid; *Pelomyia* Williston as an Ephydrid; *Eusiphona* Coquillett as a Tachinid; *Lestophonus* Williston as an Oscinid.

acters as the convergence or divergence of the minute postvertical bristles, the manner of fracture of the basal portion of the costa, and the intimate structure of the interfrontalia of the head. The form of the proboscis, the structure of the legs, the venation, particularly of the outer part of the wings, and the style of vestiture have been too recently modified, as measured in biologic time, to be of much service in indicating the interrelationships of subfamilies.

As will be noted the following analytical table makes use of characters that are not customarily employed and which require considerable magnification for their discernment. A few words will be needed to explain the terminology adopted. The structure of the cheeks, face and front has proved of great assistance in determining subfamilies: not the general shape, but the vanishing details of the proportions of the sclerites making up the head. The cheeks, that lateral portion between the eyes and the mouth, are a complex of several sclerites. Nearest the eye, the facial orbits, what the Germans designate as *Wangen*, descend from in front, their delimiting suture continuing straight downward or obliquely backward or even parallel with the eye-margin before it vanishes. This part of the cheek, nearest the eye, I have designated the *gena*, following Dr. Hough's selection of this term in his *Muscidæ of Somaliland*, 1898.¹ Next to the *gena* lies a varying-shaped piece, called by the Germans the *Backe*, and by Dr. Hough the *bucca*. The oral vibrissa is always located near the lower front angle of this piece, but the shape of the sclerite varies greatly. In the *Opomyzinæ* it is linear and parallels the narrow *gena*; in the *Milichiniæ* it is triangular, owing to an oblique extension forward of the lower occiput, in which case the cheek consists largely of this part of the occiput. Where the relative breadth of the *bucca* and the *gena* is called for the measurement should be made near the vibrissal angle, but, since the suture between these sclerites vanishes, its course may need to be projected as a continuation of that part present. In many of the *Geomyzinæ* the lateral prolongations of the center of the face are visible beneath the *buccæ*, thus forming the real margin of the mouth. These four sclerites which enter into the composition of the cheeks, probably originally sharply differentiated, are

¹ The term *gena* is in Greek *geneion*, in Italian *guancia*, in Spanish *mejilla*, in French *joue*, and in English *jowl*, but these cognates indicate merely the cheek in a generic sense.

now in such a state of fusion that their discernment is rendered a matter of some difficulty, requiring the use of a compound microscope.

For many years the Acalyprate Muscidæ have been lined up in two groups according to the course of the auxiliary vein. The distinctness with which this vein is separated from the first longitudinal is at most a matter of relativity, but since the auxiliary vein is an ancestral relict in a modern group of insects, its course does serve to interpret phylogeny. Heretofore the auxiliary vein has been cursorily looked at and has been accounted absent when there is no distinct chitinization. A close examination, both by transmitted and by reflected light, reveals a fold in the wing membrane even where the vein is lacking, and thus the former course of the vein can be determined. For exactness this part of the wing must lie flat in the field of vision. Moreover, the costa is frequently broken at the end of the auxiliary vein, whether the vein itself is present or not, and, therefore, the exact position of the costal break affords a valuable clue to the ancestral history of these flies. Just beyond the humeral crossvein the costa may be again broken, clearly discernible by transmitted light, the break occurring where some of these flies, such as *Stegana* and *Drosophila*, still fold down their wing. A distinct break at this place is characteristic of the Milichiinæ, Drosophilinæ and Ephydrinæ, but does not occur in any of the Agromyzinæ, Ochthiphilinæ, Geomyzinæ, and several of the other groups. As a single character this costal fracturing is probably as weighty as any.

The lengths of the crossveins as compared with the segments of the longitudinal veins, the proportions of the sections of the costa, and the course and termination of the longitudinal veins are all variable within certain limits, but are useful characters for less than generic determination. The shape of the calypter and the character of its fringe of cilia, the form of the alula and of the anal angle of the wing, the extent of the basal cells and of the anal vein, the position of the crossveins, the origin of the third vein, the strength of the fourth and fifth veins in particular, the hairiness of the basal section of the costa, all offer characters of more than generic value, probably having been under less rigorous selection than structures in the outer part of the wing.

Naturally, chætotaxy is important here, as it is in related Muscidæ. Not only the number of bristles and their exact location but even their

inclination must be observed. This is particularly true of the bristles on the front. The presence or absence of the anterior dorsocentrals, of the presutural, of the sternopleural, mesopleural, and rarely of the pteropleural, the number and direction of the scutellars, require notice. The postverticals, oral vibrissa, preapical tibial bristles, acrostichal and mesopleural setulæ, prothoracic bristles and the hairs of the second antennal joint are taxonomically important. The ocellars, vertical bristles, occipital, supra-alar, coxal, femoral and abdominal bristles are less utilized. However, any of the bristles may vary, and absolute stress should not be laid on the presence or absence, size or inclination of certain of the hairs. Within reasonable limits the chætotaxy is reliable and offers a most valuable guide to the genera and species.

Within the group the proboscis is quite variable. It is twice broken, the basal and end sections directed backward, the middle section forward. Sometimes it is short and largely fleshy (*Mconcura*, *Chiromyia*), again it is elongate, slender, strongly chitinized and resembles a piercing organ (*Milichiina*). Even where it is of medium size the labella may be broad and fleshy (*Rhinoessa*) or may be needle-like (*Desmomctopa*). The palpi range from large and porrect to small. Their shape and hairiness should be noted. The development of the clypeus (variously called the prelabrum, upper-lip, fulcrum, pharynx, Schlundgerüst, Chitinlufeisen) is important. Hendel restricts the term clypeus to the center of the face (antennal foveæ, Gesichtsleiste), a structure which still lacks a convenient English name. The center of the face is bounded by the facialiæ or facial ridges, which are more or less evidently separated from it and from the genæ. Sometimes the front is complex, with paraorbits, interfrontalia, ocellar triangle, cruciate bristles, and specialized stripes (Chitinleisten) between the paraorbits and the ocellar triangle, all of which may be present (*Desmomctopa*), marking the front with a letter M. Sometimes the front is simple, pollinose or not, but with the ocellar protuberance alone differentiated. The shape of the lunule is also noteworthy.

The shape and hairiness of the third antennal joint and less so of the second; the development of the arista, whether slender, elongate, pubescent, or with small or large basal segment; the excavation or convexity of the upper occiput, and the profile of the head should be noted. Less important is the structure of the thorax, abdomen and

legs. The hypopygium is enlarged only near *Tethina*, and the ovipositor is specialized rarely outside of the Agromyzinæ, where it is cuneiform or tubular. However, the number of abdominal segments is not constant, and should be observed.

In describing genera these preceding characters should be mainly noted. Meigen, Zetterstedt, Schiner and Loew lived before the days of chaetotaxy and their descriptions are hard to interpret into the following tables. These tables have been constructed from what specimens I have had to study, and I am not answerable for the correct assignment of those genera I know only from descriptions. However, my collection of this group includes thirty-seven genera, one hundred and sixty-five species and about two thousand specimens, mainly, of course, North American, and without such a representation this work would have been impossible. The lack of definite information in the older descriptions concerning characters now considered important has made it necessary at times to select characters that we would not willingly stress. The identification tables are thus largely artificial; some of the groups seem natural and phyletically related, but often the association of genera and species in the tables is due to the arbitrary emphasis of some selected character. All the genera hitherto known, the world over, are included in the tables of genera, but only the species known to occur in North America are given in the tables of species. In presenting them I trust that the tables will be workable, and that they will help and not hinder other students in unraveling the intricate species of this little known group.

The nearest relatives of the species herein discussed are the Drosophilinæ, Oscininæ and Ephydrinæ. In fact, the Geomyzinæ are more nearly related to the Drosophilinæ than they are to the Agromyzinæ. *Acartrophthalmus* of the Heteroneurinæ closely resembles the Agromyzinæ, but its auxiliary vein is more distinct and separate from the first vein and the break in the costa is near the humeral crossvein.

The accompanying tabulation of characters is given for the principal groups with which the species discussed herein might be confused. In explanation, the sclerites comprising the cheeks, the lower occiput, gena, bucca and center of the face are abbreviated *O*, *G*, *B* and *F*, respectively, and the most important one is mentioned first. Where there is but one costal break it occurs near the end of the

	Geomyzinae.	Agromyzinae.	Melichinae.	Ochthiphilinae.	Drosophilinae.	Osciniinae.	Ephydrinae.	Heterocerinae.	Pallinae.
Costa broken.....	Once	Once	Twice	None	Twice	Once	Twice	Not, or once	Once
Auxiliary vein ending in.....	Costa	i vein usually	Costa	Costa	Rudimentary	Rudimentary	Rudimentary	Costa	i vein
Anal cell.....	Present	Present	Present	Present	Present	Absent	Absent	Present	Large
Basal vein of discal cell.....	Present	Present	Present	Present	Usually absent	Absent	Absent	Present	Present
Anal vein.....	Base present	Base present	Rudimentary	Base present	Base present	Absent	Absent	Base present	Present
Cilia of calypteres.....	Loose to rudimentary	Dense	Rudimentary	Abundant	Rudimentary	Variable	Variable	Loose	Loose
Check consisting of.....	G.B.F.	B.W.	O.B.G.	G.B.F.	G.B.F.	B.G.	G(B)F.	O.G.B.	O.G.B.F.
Clypeus.....	Large	Small	Small	Small	Large	Rudimentary	Very large	Small	Small
Interfrontalia differentiated.....	Present or absent	Small	Large	Not	Large	Large		Small	Small to large
Frontal orbits differentiated.....	Usually absent	Often present	Present	Absent	Present	Absent	Present	Absent	Absent or present
Center of face.....	Inset	Flat	Sunk	Flat	Concave	Absent	Raised	Concave	Flat
Postvertical bristles.....	Converging	Diverging	Converging	Converging	Converging	Converging	Converging	Diverging	Diverging or wanting
Oral vibrissa.....	Present or absent	Present	Present	Absent	Present	Absent	Absent	Present	Present
Foremost orbital bristle.....	Recline	Convergent	Convergent	Recline	Proclinate	Wanting	Divergent	Various	Wanting
Interfrontal bristles.....	Absent or present	Absent	Present	Absent	Rare	Absent	Present or absent	Present or absent	Absent
Prothoracic bristle.....	0-2	i	Absent	Absent	Absent	Absent	Absent	i or 0	Absent
Mesopleural bristles.....	Present	Present	Rare	Absent	Absent	Absent	0 to several	Present	Absent
Arista.....	Pubescent	Closely pubescent	Loosely pubescent	Bare	Plumose	Sub-bare	Bare to plumose	Sub-bare to plumose	Pubescent

auxiliary vein, except in *Acarthrophthalmus* as noted above: where the costa is twice broken the first fracture is near the humeral cross-vein and the second at the end of the auxiliary vein. This tabulation is not infallible, but gives the characters usually and typically found. It is often a difficult matter to know to what subfamily of the smaller Muscidae a specimen should be assigned. The tabulation may therefore be found useful in verifying an identification.

In glancing over the enumerated species it will be noted that *Agromyza* is by far the dominant genus, followed by *Phytomyza*, which is a close relative. The remaining genera have but one or a few species. The characters by which many of the smaller genera are distinguished, such as the number of fronto-orbitals or dorsocentrals, the shape of the cheeks and the size of the eye, have a range of variability in *Agromyza* equal to that found in a series of the small genera, but can not be utilized for the segregation of this complex genus. In *Agromyza*, especially, the profile of the face can not be relied on too strictly. Apparently the drying of the head vaults the mouth-opening so that the epistome at times is projected more than at others and thus in some specimens it becomes visible in profile. The shape of the lunule may likewise change, according to the age of the specimen. In this genus *Agromyza* it is often impossible to determine what are varietal and what are specific limits. For instance, couplet 59, separating *melampyga* and *scutellata* is unsatisfactory, containing characters most trivial than some of the varietal characters given under those species. Extreme variations, like the black *orbona* and the yellow *melampyga*, would appear obviously distinct, but the other forms exhibit gradations connecting these extremes in every particular. The discal cell varies from small to medium, the width and shape of the front is inconstant, the maculation of the body and legs ranges over almost the entire gamut of coloration in this genus, so there is little that is tangible to use in limiting the species. Under such circumstances my determinations can not be considered infallible, but with determined European material before me for comparison the identifications given may be utilized until the type material is compared with larger collections of specimens. It is not unlikely that the less ornate species are similarly variable and that the number of described species will be materially reduced when much larger collections are studied. In several instances in the dichotomy I have

grouped a number of characters that are correlated in the specimens before me. The descriptions of the older authors are often silent regarding some of these characters, *e. g.*, the color of the calypteres, the number of fronto-orbitals or dorsocentrals, the details of venation, etc. Rather than encumber the key with repeated statements that the correlation of characters is based on the specimens studied and is not known to hold in those species that I do not possess, I have left it for the list of localities to indicate those species I have, and those concerning which there might be doubt. The localities include, in addition to places already recorded, the localities of specimens in the collections of Dr. Garry deN. Hough, now at Chicago University, and of Professor J. M. Aldrich. Those places from which I possess specimens are marked with a star (*).

While in the preparation of this paper I have depended almost entirely on the material in my own collection, still I wish here to express my appreciation of the good-will of my friend, Professor Aldrich, who has always been ready to share his collection and library whenever asked. For some years our common interest in these flies has brought out many inductions that working independently we might have missed. Mr. Charles W. Johnson has also generously sent his species of *Spilochroa* for examination.

The work on these small flies has practically all been done under the Zeiss prism binocular microscope, using mainly the a_3 objective and number 1 ocular. While a magnification of but thirty-one diameters is thus produced, the clearness afforded by stereoscopic vision has certainly repaid the extra labor of centering the specimens in the field of the microscope. Indeed, the hand lens has been practically discarded as incapable of resolving such difficult characters as the fracturing of the costa or the boundaries of the sclerites of the head. In this connection I wish to call attention to the insect holders, made by the Spencer Lens Company and the Ernst Leitz Company, a ball and socket attachment that easily enables a specimen to be viewed in any position under the microscope. For extra illumination needed in deciding difficult points I have attached over the field of the microscope a small low-voltage tungsten automobile headlight. By placing the lamp beyond the focal point the parabolic reflector concentrates the light on the specimen. A step-down transformer furnishes low voltage and a small rheostat regulates the intensity of illumination,

which can thus be instantly changed from a glow to twenty-five candle power.

A few genera which have not found their final resting place in the present systems of classification are discussed in the following notes. The first five of these genera are not included in the table of genera, the other three are.

Aulacigaster Macquart, which has been variously assigned to the *Agromyzinæ*, *Geomyzinæ*, *Drosophilinæ* and *Ephydrinæ*, has the second basal cell confluent with the discal, the anal cell well-formed, the auxiliary vein relatively distinct and entirely separate from the first vein, the costa broken at the humeral crossvein and again at the auxiliary vein, the clypeus very large, the center of the face continuing laterally under the buccæ so as to comprise a large part of the cheeks, the anterior fronto-orbitals proclinate and the postverticals convergent. This combination of characters clearly places it in the *Drosophilinæ* notwithstanding its bare arista. The West Indian species figured by Williston in his Manual, page 292, agrees with *rufitarsis* except that the auxiliary vein ends in the first in Williston's figure and the arista is pubescent.

Cyrtotum Macquart has the costa twice broken. The structure of the orbital bristles, the face, cheeks and mouth is also like that of the *Drosophilinæ*.

Leiomyza Macquart was reported by Williston, Entomological News, vii, page 185, from America, but no species was described. Becker places this genus with *Aulacigaster* in the *Drosophilinæ*. I have no specimens and so have no opinion to offer.

Lipochæta Coquillett, which Williston once referred to the *Ochthiphilinæ*, has the costa twice broken. It is a curious Ephydrid.

Sephanilla Rondani, described from Italy in 1874 and not since reported, was placed by its author with *Leucopis* and *Ochthiphila*. It is, however, a shining black species, the front with a transverse yellow band above the antennæ, the mouth-parts, antennæ, halteres and legs in part light-colored. The lack of pruinosity, the basal position of the crossveins and the course of the auxiliary vein would indicate a *Geomyzid* or perhaps a *Sapromyzid*. It is not sufficiently characterized to find a place in the table.

Pseudopomyza Strobl, located by the author in the *Drosophilinæ* or *Geomyzinæ*, is placed by Hendel close to *Desmomctopa*.

Hendel's figures show the proboscis to be like that of *Rhinoessa* and the wing like that of *Desmometopa*. It is included twice in the key to the genera in order to avoid confusion.

Rhinoessa and **Tethina** have been variously shifted. The front sometimes possesses hairs similar to the cruciate bristles of the Milichiinae, in which group they have usually been tabulated, but the structure of the face and cheeks is very much like that found in the Geomyzinae. With the latter group they find their best location, as is shown by the single break in the costa, the pollinose body and especially the pollinose front, the more or less excavated occiput, and the strong bristles, particularly of the pleuræ, such as the paired prothoracic and the row along the posterior side of the mesopleuræ. However, the auxiliary vein terminates in the first vein leaving the break in the costa close to the end of the first vein, and not some distance before, as is otherwise the case in the Geomyzinae before me, while the chitinized and lengthened proboscis and the sometimes prominent vibrissal angles show great similarity to Milichiine characteristics. Professor Aldrich first suggested to me the identity of *Pelomyia* Williston with *Tethina*.

TABLE OF SUBFAMILIES.

- Auxiliary vein separated from the first vein, sometimes touching it before the end and then again separating so as to end much before the termination of the first vein; postverticals convergent or wanting; costa complete, at most slightly weakened just before the end of the auxiliary vein; densely gray-pruinose species, abdomen usually pictured with brown or black spots; oral vibrissæ wanting or not differentiated; frontal suture transverse, not highly arched: interfrontalia differentiated only by a difference in color or sheen of the pollen, without cruciate inner frontal bristles, the ocellar triangle pollinose; occiput flattened; oral margin not deeply excised in front, center of the face broad, relatively flat and not impressed beneath the plane of the orbits, no vibrissal angle; genæ and buccæ of cheeks not differentiated; proboscis short, not bent back at the end; prothoracic bristles wanting; one posterior sternopleural; mesopleuræ usually bare, rarely with sparse setæ; front femora with a series of uniform bristles on the outer flexor edge; no preapical bristles on tibiæ, middle tibiæ with apical spur; calypter large, ciliate; anal angle of wing well developed, anal vein entirely rudimentary, basal cells complete. *OCITHIPHILINÆ*.
- Auxiliary vein fused with the first vein for much of its length, or entirely rudimentary; costa broken at least before the end of the first vein;

rarely silvery-gray pruinose; oral vibrissæ often present; frontal suture usually arched, sometimes flattened.....2.

2. Costa broken twice, once beyond the humeral crossvein at which place there is usually a stronger costal bristle, and again just before the end of the first vein; hairs of oral margin borne wholly or largely on the lower occiput which arches forward under the eye, the genæ greatly reduced, leaving the buccæ more or less triangular, with the oral vibrissa at its front angle; face in profile concave, the vibrissal angle often prominent and projecting as far as the level of the frontal suture; a double row of cruciate bristles present along the middle of the front, borne sometimes on specialized stripes, the interfrontalia often evident and formed from the enlarged ocellar triangle; oral margin often arched in front; proboscis geniculate, and usually lengthened, the labella rarely fleshy; postverticals convergent, rarely parallel or wanting, but never divergent; anterior dorsocentrals, prothoracic, and mesopleural bristles rarely present; calypter small, rarely densely ciliated; anal vein entirely rudimentary or wanting.

MILICHIINÆ.

Costa not, or but very rarely, broken at the humeral crossvein, and without corresponding bristle; bucca quadrangular or linear, or if triangular usually broader behind, the occiput rarely reaching forward on the cheeks, the hairs of the oral margin therefore together with the vibrissa borne by the bucca; face retracted or the vibrissal angle not evident, produced only in some species of *Rhinoessa* and *Tethina*; front usually devoid of cruciate bristles, though sometimes hairy; ocellar triangle usually reduced, insect often pollinose; oral margin not highly arched in front; proboscis short, usually very short, labella rarely chitinous; prothoracic and mesopleural bristles usually present; calypter usually large and densely ciliate; base of anal vein usually evident

3. Postverticals divergent, rarely wanting; basal joint of arista minute, shorter than broad, the remainder of the arista closely short-pubescent; auxiliary vein, though rudimentary, usually ending in the first vein instead of in the costa (sometimes, *e. g.*, *Phytomyza*, *Cryptochatum*, the auxiliary vein parallels the first vein for its entire course) and rarely (*e. g.*, *Agromyza* spp.) it approaches the first for a short distance to bend away at the tip; the break of the costa at the end of the auxiliary vein, therefore, usually just in front of the termination of the first vein; genæ narrower than the buccæ (except in *Phytomyza* spp.); upper occiput not deeply concave; prothoracic bristle single.

AGROMYZINÆ.

Auxiliary vein more or less distinct from the first vein and ending separately in the costa at a greater distance from the first vein than its separation from it along the middle of its course, rarely the end of the auxiliary vein has completely vanished, in which case the fracture of the costa some distance before the ending of the first vein indicates

its former course (in *Rhinoessa* and *Tethina* the auxiliary vein ends in the first vein); genæ broader than or as broad as the buccæ; postverticals convergent or wanting; antennal arista often loosely pubescent or plumose, the basal joint always longer than wide, sometimes even elongate and hairy; often the hairs of the oral margin are in more than a single row; upper occiput often markedly concave; prothoracic bristle sometimes paired.....GEOMYZINÆ.

SUBFAMILY OCHTHIPHILINÆ.

TABLE OF GENERA.

- But two posterior dorsocentrals; postverticals wanting; third antennal joint short, reniform, the arista short and rather thick.....2.
- Presutural and postsutural dorsocentrals present; postverticals convergent; third antennal joint longer, its upper outer end rather angulate.....3.
2. Ocellar and fronto-orbital bristles wanting; palpi broad; mesonotum with numerous setulæ; one presutural; second antennal joint bristleless; mesopleuræ and pteropleuræ bare; alulæ large and rather pointed. (Europe, Asia, North America.).....*Leucopis* Meigen.
- A pair of ocellar and two fronto-orbital bristles present; second antennal joint with a bristle on the upper side; mesopleuræ and pteropleuræ with sparse setulæ. (Europe.).....*Cremifania* Czerny.
3. Head flattened, triangular, pointed at the insertion of the antennæ, face nearly horizontal; eyes horizontally oval; wings pictured. (Europe, North America.).....*Acrometopia* Schiner.
- Head more rounded, front not projecting; eyes rounded, not transverse..4.
4. Dorsocentrals 1 + 2; no mesopleural bristles; foremost fronto-orbital anterior to the middle of the front; head but little broader than the thorax. (Europe, Asia, North America.).....*Ochthiphila* Fallen.
- Dorsocentrals 1 + 3 (or 4); mesopleuræ sometimes with setulæ; foremost fronto-orbital opposite middle of front; head conspicuously broader than the thorax. (Europe.).....*Parochthiphila* Czerny.

LEUCOPIS Meigen.

Densely gray pruinose species of bluish-white luster, the abdomen more purely white-gray. This pruinosity seems to increase with the maturity of the individual, so that it does not altogether have specific value. I have one specimen, presumably *simplex*, where even the antennæ and palpi are completely coated. The maculation of the abdomen and the distinctness of the thoracic stripes are quite variable. Indeed, it is doubtful if the species listed in the table represent valid species, for there is much gradation. Most of my specimens belong

to *griseola*, a species which has not been hitherto reported from America. Some individuals lack entirely the spots of the abdomen; in others there is a tendency to forming the median stripe of *bella*. Quite probably many of the records of *bella* should be referred to this species. However, *griseola* is reported aphidivorous while *bella* is coccivorous. #

TABLE OF SPECIES OF *Leucopis*.

- Front tarsi wholly or principally yellow.....2.
 Front tarsi wholly or principally black; thorax with two central linear cinereous black and two other broad brown vittæ; first abdominal segment blackish, the second with a pair of black dots; front bivittate with black; base of antennæ pruinose; legs black or cinereous, the knees and base of posterior tarsi yellow; wings whitish, the costa infuscated. 1-1.5 mm. (Eur.;* Ga.,* La.,* Id.,* Wash.*).....*griseola* Fallen.
2. Abdomen immaculate, thorax and front not vittate; legs black, the tibiæ at base and tip and the tarsi yellowish; wings hyaline. 1.5 mm. (N. Y., Mass., N. J., N. H., D. C., Va., Ga., Mich., Nebr., Wash.)*
simplex Loew.
- Abdomen more or less spotted; thorax with two brown stripes.....3.
 3. Abdomen with first segment cinereous black, the second segment with a pair of blackish spots, and the rest of the abdomen immaculate; thorax bivittate; center of front gray, the orbits more silvery; antennæ black. 2 mm. (Eur.; N. H., N. J., D. C., Ind., La.,* Tex., N. Mex., Cal.)**nigricornis* Egger.
- Abdomen marked with additional spots; antennæ more or less pruinose...4.
 4. Thorax marked with two brown vittæ convergent behind; front bivittate with cinereous black.....5.
 Thorax not vittate with brown; front cinereous; abdomen with two lateral spots and a median basal vittula of velvety black upon segments 2, 3 and 4. (Nebr.) (Can. Ent., XLII, 241, 1910.)...*maculata* Thompson.
5. Abdomen with the first segment black except the margins, the second marked with three spots, the third and fourth with a median basal black spot; antennæ cinereous; wings milky. (W. Ind., Fla., Col., Can., Cal., Mex.).....*bella* Loew.
- Abdomen with the first segment marked with deep brown except laterally and posteriorly, the second, third and fourth segments with a slender sub-interrupted stripe and a pair of rounded brown spots, diminishing in size; base of antennæ cinereous; wings hyaline. (Tex.,* N. Mex., Mex., Id.)*.....*bellula* Williston.

ACROMETOPIA Schiner.

Tibiæ and front tarsi black; third antennal joint three times as long as wide, bluntly rounded; front with a broad brown vitta; abdomen with many

black dots; basal half of wings with five brown dots, apical half with four fasciæ. 2.5 mm. (Ga.).....*punctata* Coquillett.
 Tibiæ and tarsi yellow; third antennal joint less than two times as long as wide, the apical angle nearly rectangular; segments two to five of abdomen each with a basal pair of black dots; wings marked with numerous dots and streaks. 2 mm. (Cuba.)....*maculata* Coquillett.

OCHTHIPHILA Fallen.

Hendel (Wien. ent. Ztg., XXIX, 313, 1910) and Coquillett (Type Species N. Am. Gen. Dipt., 1910) prefer the name *Chamæmyia* Meigen, 1803, to the generally accepted *Ochthiphila* of Fallen, changing also the subfamily name to Chamæmyinæ. *Chamæmyia* was given by Meigen in Illiger's Magazine as a genus, with no species mentioned. In 1810 Panzer described *Chamæmyia elegans*, and therefore the genus is usually accredited to him. In view of the present sentiment regarding the overthrow of names in general usage, I regard it unnecessary to discard Fallen's name *Ochthiphila*.

Ochthiphila hispina Thomson, from California, is probably the female of *Schænomyza litorella* Fallen.

TABLE OF THE SPECIES OF *Ochthiphila*.

- Antennæ wholly or in part yellow.....2.
- Antennæ entirely black; palpi dusky.....4.
- 2. Third, fourth and fifth segments of the abdomen with broad fasciæ interrupted in the middle; a vague fascia across the middle of the front, and another narrowly above the lunule; antennæ reddish, the third joint brown above, the arista brownish yellow. 2 mm. (Eur.; N. J.).....*elegans* Panzer.
 Abdomen with round black spots or else entirely unspotted; front not fasciate; arista brown.....3.
- 3. Antennæ wholly yellow, sometimes dusky at the base and apex; abdomen usually not spotted, sometimes with small spots on the fifth segment; proboscis and palpi yellow; legs yellow, the femora cinereous black except at the tip. 3 mm. (Eur.; Ont.).....*maritima* Zetterstedt.
 Antennæ black, only the middle yellow; abdominal segments two to five, with paired round black spots, laterally also spotted; palpi blackish, apically yellowish. 2-3 mm. (Eur.;* Mass,* N. Y.,* Can.,* N. J., Wisc., Ill., Wash.*).....*polystigma* Meigen.
- 4. Legs principally black, the knees and hind metatarsi yellow; abdomen with at most three pairs of black spots. 2 mm. (Eur.; Col.)
geniculata Zetterstedt.

- Tibiæ entirely yellow.....5.
5. Abdomen usually with three pairs of dorsal black spots, and corresponding lateral spots; arista blackish; legs yellow except the base of the femora cinereous black and the end of the tarsi brown. 2-3 mm. (Eur. ; * Mass., Col. *).....*juncorum* Fallen.
- Abdomen entirely unspotted, lacking both the dorsal and the lateral markings. 2-3 mm. (Eur. ; * Col., * Wash. *).....*aridella* Fallen.

SUBFAMILY MILICHIINÆ.

TABLE OF GENERA.

- Costa prolonged as a pointed lappet at its break at the end of the auxiliary vein; lower fronto-orbitals bent inward; interfrontal stripes bearing evident cruciate bristles; abdomen often silvery; last section of fourth vein at most two times as long as the preceding section; calypteres with long cilia; cheeks very narrow; mesopleuræ often bristly. (Group MILICHIINA.).....2.
- Basal section of costa not overlapping the outer section at the break before the end of the first vein; cruciate bristles sometimes reduced; abdomen rarely silvery; last section of the fourth vein at least three times as long as the preceding section; anterior crossvein beyond the costal break; mesopleuræ rarely with bristles; calypteres rarely with dense cilia. (Group MADIZINA.).....7.
2. Hind margin of eye not excised; eyes pubescent.....3.
- Hind margin of eye excised at the level of the antennæ: this may be a narrow excision or may continue to the lower corner of the eye....4.
3. Mesopleuræ bare; proboscis not remarkably developed, palpi spatulate; face broader. (Europe, Africa, Java.).....*Milichia* Meigen, sens. str.
- Mesopleuræ with three or four strong bristles; proboscis elongate and geniculate, the outer portion long and directed backward; palpi slender; face narrow. (South America, North America.)
- Phleomyia* Bilimek.
4. Mesopleuræ without strong bristles; first segment of male abdomen projecting over the middle of the second segment.....5.
- Mesopleuræ with strong bristles; posterior margin of the first segment of the abdomen ♂♀ straight, not medially gripping the second segment; proboscis not lengthened. (South America.)...*Pseudomilichia* Becker.
5. Head and thorax roughened, with fine pubescence; proboscis very long and geniculate. (South America.).....*Ulia* Becker.
- Head and thorax smooth, the hairs and bristles normal; proboscis normal.6.
6. Four dorsocentrals; pubescence of mesonotum scattered and coarse. (South America.).....*Eccoptomma* Becker.
- One or two dorsocentrals; pubescence of mesonotum close and short. (Europe, Africa, New Guinea, Hawaii, North America, South America.).....*Milichiella* Giglio-Tos.

- 7. Front narrow, nearly three times as long as the width above, with about eleven pairs of uniform fronto-orbitals; first vein ends near the middle of the wing; third and fourth veins converging so as almost to close the first posterior cell; three humeral bristles, one presutural, two small dorsocentrals placed well back; costa almost bare; calypteres rather large, the upper one delicately ciliate; head large, hemispherical, cheeks very narrow, no vibrissal angle; proboscis very long, slender and geniculate; eyes bare. (North America.)..*Eusiphona* Coquillett.
 Front relatively broader, never with many large fronto-orbitals; first vein ends nearer base of the wing; first posterior cell never markedly narrowed; calypteres rudimentary.....8.
- 8. Hairy, almost bristleless, no vibrissæ, fronto-orbitals or scutellars; front, eyes, mesonotum and pleuræ^o hairy; front below ocelli over twice as long as wide; cheeks one sixth the eye-height; proboscis short and robust. (North America.).....*Arctobiella* Coquillett.
 Not densely hairy species, macrochètæ differentiated; front transverse or quadrate (rarely, *e. g.*, *Platophrymyia*, *Leptometopa*), longer than wide9.
- 9. Proboscis long, chitinized and geniculate, the outer portion folding back; vibrissal angle of cheeks usually distinct.....10.
 Proboscis very short, fleshy, the labella not strongly geniculate, nor constructed for piercing; oral margin not or scarcely projecting, usually several vibrissæ in an oblique row in front.....22.
- 10. Arista thickened; third antennal joint small; front square; palpi linear, long and porrect; bristles strong, a presutural and a dorsocentral present in front of the suture; costa not bristly, stopping at the third vein. (North America.).....*Aldrichiella* Hendel.
 Arista slender; front usually transverse; palpi more or less clavate; mesonotum rarely bristly in front of the suture.....11.
- 11. Posterior crossvein and anal cell entirely wanting, the anterior crossvein located much before the end of the first vein, the costa stopping at the third vein; cheeks narrow; palpi slender; tibiæ slender.....12.
 Posterior crossvein present, the anterior crossvein opposite or beyond the end of the first vein; anal cell usually present.....13.
- 12. Face with a prominent central nasiform projection; antennæ rather long, arista bare; one presutural, mesopleural bristles present. (Africa.)
Risa Becker.
 Face deeply concave; antennæ short, the third antennal joint large, orbicular, the arista pubescent; no mesopleural bristles. (North America.)
Paranyia Williston.
- 13. Tibiæ, especially the hind pair, compressed, explanate, and more or less clavate, particularly in the male; costa extends to the fourth vein..14.
 Tibiæ not compressed and clavate in either sex; palpi large, porrect...17.
- 14. Head horizontally longer than high, the entire under side horizontally straight; front longer than wide; pteropleuræ with bristles; third and

- fourth veins convergent, ending at wing-tip; base of costa not bristly; palpi elongate. (Africa.).....*Leptometo*pa Becker.
- Head higher than long, the lower side not entirely horizontal; front not narrowed; first posterior cell not narrowed, ending beyond the wing-tip; palpi short and broad.....15.
15. Antennæ broadly separated by the large carinate lunule; oral margin retracted; base of costa not bristly; pteropleural bristle present. (Asia.)
Hypaspistomyia Hendel.
- Antennal grooves confluent, the lunule not large; vibrissal angle prominent16.
16. Base of costa furnished with bristly hairs; whole body opaque; cruciate bristles of front strong and usually on evident stripes; the two upper fronto-orbitals bent outward. (Europe, Asia, Africa, North America.)
Desmometopa Loew.
- Base of costa not bristly; body polished; cruciate bristles delicate, of the upper fronto-orbitals the anterior is proclinate, the other reclinate. (Europe, North America.).....*Madiza* Fallen.
17. Under side of head long, straight, horizontal, the epistome projecting; front narrowed, with a longitudinal depression on each side; face carinate; abdomen pruinose; anterior dorsocentrals absent. (North America.).....*Platophrymyia* Williston.
- Under side of head rounded, not entirely horizontal; front quadrate; abdomen not pruinose; palpi greatly compressed.....18.
18. Four strong dorsocentrals and one presutural present; third antennal joint very large, in the male quadrate; arista loosely pubescent; eyes hairy; three upper fronto-orbitals; scutellar bristles diverging; palpi bristly; dark pollinose species. (Europe, North America.)
Phyllomyza Fallen.
- Anterior dorsocentrals rarely present; eyes nearly or quite bare; palpi not markedly bristly; shining or subshining species.....19.
19. Anterior fronto-orbitals wanting, leaving only the upper three; apical scutellars converging; antennæ normal.....20.
- About six pairs of fronto-orbitals descending quite to the antennæ, the lower set converging; proboscis slender, the part folding back as long as the middle portion; one or two dorsocentrals; no mesopleural bristle21.
20. One dorsocentral and one pair prescutellars on the same transverse line, two supra-alar, one sternopleural; the upper fronto-orbitals on a line with the posterior ocelli, the second a little above the middle of the distance between the lower ocellus and the antennæ, the lowest immediately below the second and proclinate; cheeks narrow. (Europe, North America.).....*Cacoxenus* Loew.
- One anterior and three posterior dorsocentrals, three rows of acrostichals, no prescutellar, three weak supra-alar and one intra-alar; no sternopleural, one weak and one strong mesopleural; the three uniformly

spaced reclinate fronto-orbitals descend below the middle of the front; cheeks one third the eye-height; anal and second basal cells wanting, alula wanting (?), base of costa with bristly hairs; ovipositor large, broadly oval; labella fleshy and short. (Europe.)

Pseudopomyza Strobl.

21. Third antennal joint not large; three upper fronto-orbitals; bristles long, the apical scutellars diverging; middle and hind femora slightly enlarged; palpi greatly compressed, bare except for a few bristles on lower edge and at tip; base of costa with short fine hairs, the sections of the fourth vein 1:3; eyes round; testaceous species. (North America.)*Stomosis* n. g.

Third antennal joint very large, in the male quadrate and woolly-pubescent; two or three upper fronto-orbitals; scutellars converging; femora not incrassate; base of costa with short bristly hairs, the penultimate section of the fourth vein less than one third the length of the ultimate; eyes vertically lengthened; black species. (North America.)

Neophyllomyza n. g.

22. Wings rudimentary, scarcely longer than the scutellum; abdomen broadly swollen; one oral vibrissa; antennae lying in a deep facial groove; mesonotum without discal macrochaetae. Parasitic on birds. (Europe.) (See: Collin, Nov. Zool., 18, 138 (1911).).....*Carnus* Nitzsch.

Wings normal, longer than the abdomen; abdomen not swollen; not parasitic23.

23. Second, third and fourth veins curving forward, ending before the tip of the wing; posterior crossvein beyond the middle of the wing; costa reaching the fourth vein; scutellum large, with lateral spinous tubercles near the apex, the apical scutellar bristles diverging; mesonotum punctulate, pleurae smooth; cheeks very narrow. (Africa.)

Rhodesiella Adams.

Fourth vein ends beyond the wing-tip; scutellum normal, the apical bristles cruciate; mesonotum not punctulate; mesopleural bristles present; cheeks comparatively broad.....24.

24. Costa continuing to the fourth vein; posterior crossvein much beyond the end of the first vein, the penultimate section of the fourth vein longer than the ultimate section of the fifth; costa not bristly; face strongly carinate; postverticals parallel; one pair of interfrontal cruciate bristles; anterior dorsocentral present. (North America.).....*Paramadiza* n. g.

Costa evanescent beyond the third vein; discal cell minute, the penultimate section of the fourth vein about one fourth the length of the ultimate section of the fifth vein.....25.

25. Entire costa with well-separated bristles; second and third veins converging; center of the front with many rough hairs; face with a hemispherical subantennal depression; anterior dorsocentral present; tibiae compressed. (Asia.).....*Horaismoptera* Hendel.

Costa not spinose, but pectinate with stiff bristles up to the end of the

first vein; third vein ending at the wing-tip, not converging with the second vein; one pair of interfrontal cruciate bristles; face with two subantennal depressions and carinate medially between them; anterior dorsocentral wanting; postverticals parallel. (Europe, Africa, North America.).....*Meoneura* Rondani.

PHOLEOMYIA Bilimek.

- Three evident dorsocentrals; thorax nearly matte brownish black; abdomen of male not silvery.....2.
 One or two evident dorsocentrals; abdomen of male more or less silvery white3.
 2. Sides of front nearly parallel, the width of the front at the antennæ equal to the length of an antenna; abdomen concolorous with the thorax or slightly more shining. 4 mm. (W. Ind., N. H., Mass.,* Ct., Pa.,* N. J., Fla.,* Ga.,* Nebr., Id.*) (*Milichia*).....*indecora* Loew.
 Front greatly narrowed toward the antennæ so that its least breadth is but little more than one-half the length of an antenna; abdomen with a dull red silky sheen. 4 mm. (Hayti.).....*myopa* n. sp.
 3. All the segments except the first of the male abdomen silvery.....4.
 At least two segments of the male abdomen not silvery.....5.
 4. Second segment of the male abdomen longer than the third and fourth together. 3 mm. (W. Ind., Ga.) (*Milichia*)....*leucogastra* Loew.
 Abdominal segments of uniform size. (Ga.*) (Ann. Mus. Nat. Hung., V, 524, 1907: *Rhynchomilichia*).....*leucogastra* var. *dispar* Becker.
 5. Second segment of the male abdomen with a median crescentic blackish spot on the silvery ground, the third and fourth segments wholly silvery. 3 mm. (Hendel: Wien. ent. Ztg., XXX, 40, figs. 5-7, 1911.) (S. Am., Mex.)*leucozona* Bilimek.
 Second segment black, the third and fourth not wholly silvery.....6.
 6. Entire abdomen matte black, only the fifth segment with two silvery lateral spots. 2.5 mm. (Ga.) (Ann. Mus. Nat. Hung., V, 524, 1907.) (*Rhynchomilichia*)*pseudodecora* Becker.
 First and second segments entirely black, the front of the third, fourth and fifth segments with silvery fasciæ, that of the fifth segment interrupted. 2 mm. (Fla.) (*Milichia*).....*robertsoni* Coquillett.

Pholeomyia myopa new species.

Male.—Very close to *indecora* Loew, but differing in the structure of the head. The eyes are larger, encroaching on the front and face, the facets are larger, requiring about five to measure the width of the third antennal joint, whereas in *indecora* about six facets span the same distance. The front is conspicuously but uniformly narrowed toward the antennæ, where it is much narrower than the length of an antenna. The ocelli are close together and small, the ocellar triangle smaller than the third antennal joint. The cruciate

bristles are greatly reduced, but three distantly spaced pairs of insignificant hairs remaining. The lunule is highly arched, and notched at its summit. The face is correspondingly narrowed, and is provided with a median seam, which is lacking in *indecora*. The crowding of the face raises the oral bristles, which ascend fully half way to the antennæ. The palpi are bristly. In *indecora* the palpi are almost devoid of bristles and the oral vibrissæ do not extend half way to the antennæ. Furthermore, the abdomen of the present species is silky, with a distinct red sheen.

One specimen. Hayti.

MILICHELLA Giglio-Tos.

Mesonotum gray pruinose, with five vittæ, of which the median one extends almost across the scutellum; abdomen brownish, somewhat shining; one dorsocentral; palpi white. 1.5 mm. (Porto Rico.) (*Ophthalmomyia*.)*cinerea* Coquillett.

Shining black species; thorax devoid of pollen; usually two dorsocentrals. . . . 2.

2. Palpi red, only the tip blackened; lunule, root of antennæ, knees and tarsi brownish; abdomen of male and female black. 3-4.5 mm. (Cal.)* (Wien. ent. Ztg., XXX, 39, 1911.).....*nitida* Hendel.

Palpi, lunule, legs, etc., black.....3.

3. Upper side of abdomen of male entirely silvery. 2.5 mm. (N. Y., Ont.,* N. J., Fla., Ga.,* Kans.) (*Milichia: Lobioptera*.).....*arcuata* Loew. Abdomen of male and female mostly or wholly black.....4.

4. Second segment of male abdomen with a lateral silvery spot. 3.25 mm. (N. J.)*.....*bisignata* n. sp. Abdomen wholly without silvery markings.....5.

5. Wings milky, veins white, first posterior cell almost closed in the margin. 2.5-3 mm. (Afr.; E. Ind.; W. Ind.)* Hawaii; S. Am.; N. J., D. C., Fla., Ga.,* Tex.,* N. Mex., Kans.) (*Ophthalmomyia*.)

lacteipennis Loew.

Wings hyaline, first vein heavy and brown, a dark spot at the tip of the costal cell, first posterior cell narrowed but not nearly closed at its apex. 3 mm. (Cal.) (1 Rept. Laguna Marine Lab., 162, fig. 94, 1912.)*nigrella* Cole.

Milichiella bisignata new species.

Male.—Length 3.25 mm. Vertex a little wider than one third the head; third antennal joint with gray spongy pubescence, slightly reddish in ground color on the sides at the base; lunule black; about six vibrissæ; palpi black. Mesonotum glistening black; scutellum shining black; knob of halteres yellow. The four basal segments of the abdomen overlaid with brown dust except as follows: the extreme sides of the first segment, the broad sides of the second, the apical angles of the third and fourth. The extreme base of the fifth seg-

ment is similarly dusted, the remainder polished black. The apical angles of the second segment filled with a transverse silvery spot, the anterior margin of which is round. Legs black. Calypteres pure white. Wings hyaline, veins pale yellow, but a brown spot near the end of the first vein; third vein straight, the fourth vein curving forward so that the apex of the first posterior cell is one third as wide as the end of the submarginal cell.

I have two specimens before me, received from Professor Aldrich. These were collected by Mr. C. W. Johnson at Riverton, New Jersey, and bear date of July 4. The name *bisignata* is a manuscript name given by Mr. Coquillett to this species and has been used in the New Jersey Lists.

EUSIPHONA Coquillett.

Dull black, including the antennæ, palpi, halteres and legs, the tarsi infuscated; the face and genæ white-pruinose, and when viewed from in front the whole front between the narrow orbits is golden pruinose, leaving the elongate narrow ocellar triangle black; wings very faintly smoky. 5 mm. (Vt.,* N. J., Ill.,* Col.).....*mira* Coquillett.

ARCTOBIELLA Coquillett.

Black, including the halteres, the body opaque, somewhat velvety; wings pale brownish, the anterior crossvein near the middle of the discal cell. 4 mm. (B. C.).....*obscura* Coquillett.

ALDRICHIELLA Hendel.

Testaceous, the antennæ reddish with black arista, palpi yellow, proboscis black; a dark spot above the neck on the occiput and thorax, mesonotum reddish, scutellum, pleuræ and venter yellow, tergites black, but the sides of the abdomen becoming increasingly yellow towards the anus; metanotum and a spot at the base of the hind coxæ black; halteres yellow, wings hyaline. 2.5 mm. (S. Dak.*) (Wien. ent. Ztg., XXX, 37, 1911.)*agromyzina* Hendel.

PARAMYIA Williston.

Shining black, the front with a dull stripe on each side of the elongate ocellar triangle; halteres, knees, front tibiæ and the tarsi brown; postverticals long, cruciate, one sternopleural; palpi long, straight and porrect; both the upper divergent and the lower convergent fronto-orbital bristles present. 2 mm. (Pa., Ga.,* W. Ind.) (*Nigra* Williston.) (*Phyllomyza*)*nitens* Loew.

DESMOMETOPA Loew.

The interfrontal cross-bristles located on evident stripes which form a letter M on the black front.2.

The cross-bristles are not located on specialized stripes; front red anteriorly; cheeks, palpi and halteres yellow; front tibiæ with two narrow pale rings, tarsi annulate; hind femora of male strongly explanate. (Eur.; Ont.; Mass.,* Pa.,* N. J., Ill.,* Tex.,* S. Dak., Ala., Wash.*)

latipes Meigen.

2. Halteres black; palpi and legs wholly black; entire insect black. (Eur. ;* Id., Wash.,* B. C.)**sordidum* Fallen.

Halteres pale3.

3. Palpi wholly black; tarsi more or less reddish; cheeks black, narrow, the pollinose lower edge delimited from the polished upper part by a waving line. (Africa; Asia; Cuba; Ga.,* Mass.,* Tex.)* .*tarsalis* Loew.

Palpi yellow at the base and black at the end; tarsi black; cheeks one third the eye-height, the pollinose lower portion with biangulate margin. (Eur.; Afr.; Mass.,* N. J.)*m-nigrum* Zetterstedt.

MADIZA Fallen.

Polished black, including the halteres, the abdomen very lightly dusted; lunule, palpi and posterior tarsi yellowish; wings whitish hyaline, veins pale yellow. 2 mm. (W. Ind.; Mass.,* N. Y.,* N. J., Ill.,* Fla., Tex.,* Col.,* Wyom.,* N. Mex., Id., Wash.,* B. C.)* (*Desmometopa*.)

halteralis Coquillett.

PLATOPHRMYIA Williston.

I strongly suspect that this genus and *Leptomctopa* Becker are the same. The narrowed first posterior cell, the pruinose abdomen, the whitish wings, the narrowed front, and the long horizontal oral margin are suggestive of the synonymy. The strikingly explanate hind tibiæ of *Leptomctopa* are characteristic of the males alone. It is possible either that the West Indian species is not so formed, in which case the two are different genera, or that the description of *Platophrymyia* was drawn up from a female. Williston states that the legs are short and rather strong, a description that characterizes the female of *Leptomctopa*. I have specimens of *Leptomctopa* from Cape Colony, South Africa.

Black, including the antennæ and palpi; thorax lightly cinereous, abdomen pruinose; halteres yellow; metatarsi yellowish; wings whitish-hyaline. 2 mm. (W. Ind.)*nigra* Williston.

PHYLLOMYZA Fallen.

Dull black, the halteres, tarsi and more or less of the tibiæ brown; wings cinereous hyaline; interfrontal setulæ continuing to the lunule; third antennal joint of female orbicular, of male very large, quadrate and sericeous-pubescent; face of male greatly excised in profile. 2.5 mm. (Eur.)* N. J.) *securicornis* Fallen.

CACOXENUS Loew.

Head and thorax blackish, but overlaid with opaque yellow pollen; legs, abdomen and scutellum yellow, the base of the scutellum merging with the color of the mesonotum; wings hyaline, with yellow veins. 2 mm. (Cuba.) *semiluteus* Loew.

STOMOSIS new genus.

Postverticals long, cruciate; ocellars distant from each other the width of the front ocellus; interfrontal hairs very few, a pair of converging hairs at the middle of the front; three upper diverging fronto-orbitals; buccal ridge with a row of small bristles diminishing in size toward the occiput; lowermost occiput with three oral bristles. Proboscis long, slender, rigid, geniculate at the middle; palpi elongate, spatulate, strongly compressed, bristly along edge at tip. Third joint of antennæ rounded, orbicular, incumbent on the face; arista one and one half times the length of the antennæ, short-pubescent with fine and rather close hairs. Eyes rounded, the cheeks one sixth the eye-height; vibrissal angle moderately prominent; face much excised in profile; genæ greatly attenuated along the middle of the face. One humeral, two notopleural, one presutural, one supra-alar, two intra-alar, two approximate dorsocentrals, six rows of acrostichals; the apical scutellars very long and diverging; one posterior sternopleural. Legs rather stout, front femora with bristles, no preapical tibial bristles. Costa continuing to the fourth vein; before the first vein the costa has short, fine hairs; second, third and fourth veins parallel; sections of fourth vein proportioned about one to three, the penultimate section slightly longer than the ultimate section of the fifth vein.

Type: *Stomosis (Dcsmometopa) luteola* Coquillett.

Testaceous, including the antennæ, halteres and legs, the abdomen a little brownish; a brownish line extends along the upper edge of the sternopleura; arista and bristles black; wings hyaline, veins yellowish. 2 mm. (Ariz., Tex.)* *luteola* Coquillett.

NEOPHYLLOMYZA new genus.

Postverticals converging; paired cruciate bristles present along the middle of the front; fronto-orbital bristles extending quite to the antennæ, the upper ones diverging, the lower converging. Face excavated, cheeks narrow, the vibrissal angle prominent, oral vibrissæ large; eyes vertically lengthened. Antennæ large, of the male greatly enlarged, the arista slender, short-pubescent, the hairs dense or loose. Proboscis long, slender, geniculate; palpi enlarged, compressed, porrect, bristly along the edge at the end.

One large dorsocentral, one humeral, two notopleural, one presutural, two supra-alar, acrostichal and other setulæ numerous and uniformly distributed; apical scutellar bristles long and converging; one sternopleural, no mesopleural bristles. Legs rather strong, setulose; pulvilli minute; no preapical tibial bristles. Costa attains the fourth vein, twice broken, towards the base ciliate with fine, small bristles and with a stronger humeral bristle before the first break; second, third and fourth veins parallel; crossveins approximate; fifth vein evanescent; second basal and anal cells rudimentary or incomplete.

Type: *Neophyllomyza quadricornis*, new species following.

TABLE OF SPECIES OF *Neophyllomyza*.

- Submarginal cell narrowed at its extremity, its costal margin about one half that of the first posterior cell; penultimate section of the fourth vein less than one third as long as the ultimate section; knees, more or less of the tibiæ and all of the tarsi yellow; frontal orbits subshining; mesonotum shining; proboscis shorter than the head. 1.5 mm. (West Ind.) *magnipalpus* Williston.
- Submarginal cell as broad as the first posterior cell at the extremity; at least the tibiæ black; proboscis longer than the head.....2.
2. Mesonotum polished black; orbits narrowly shining; penultimate section of the fourth vein one third as long as the ultimate section; anal cell rudimentary; tarsi yellow; halteres shining black. 2.25 mm. (Id.)*
nitens n. sp.
- Mesonotum sericeous black; front entirely sericeous; penultimate section of the fourth vein less than one fourth as long as the ultimate section; anal cell wanting; tarsi black or blackish; halteres blackish. 1.5 mm. (Id.,* Wash.,* N. Mex.,* La.)*.....*quadricornis* n. sp.

Neophyllomyza quadricornis new species.

Male.—Length 1.5 mm. Black, subshining. Front sericeous, the orbits, ocellar triangle and the stripes for the cruciate bristles not differentiated; two

diverging upper and two converging lower fronto-orbitals; three pairs of cruciate bristles and an additional one above the base of each antenna; front broader than long, the frontal suture arched over each antenna. Face extraordinarily excavated to receive the large antennæ, the facial orbits obliterated; cheeks one tenth the eye-height. The third joint of the antennæ greatly enlarged, subquadrate, reaching quite to the oral margin, densely clothed with erect silky pubescence, the arista as long as the diagonal of this joint. Proboscis long, slender, the elbow extending much beyond the epistome; palpi porrect, compressed, subulate. Mesonotum subshining, almost sericeous; one large dorsocentral, setulæ numerous; pleuræ polished; abdomen subshining. Legs entirely black, at most the tarsi brownish. Halteres dull black; calypteres dusky, with a loose fringe. Wings hyaline, the veins black; the vein between the first and second basal cells wanting, anal cell entirely wanting; penultimate section of the fourth vein about one fifth as long as the ultimate section and about one half the length of the ultimate section of the fifth vein.

Female.—The female differs in the structure of the head. The third joint of the antennæ is much reduced in size, scarcely reaching the mouth and it is less quadrate, but is similarly pubescent; the arista is nearly two times the length of this joint. The face is less remarkably excavated.

Five males and two females from the Cedar Mountains of Idaho; Bellingham, Washington; Cloudcroft, New Mexico; and Opelousas, Louisiana.

***Neophyllomyza nitens* new species.**

Female.—Length 2.25 mm. Polished jet black, the tarsi alone yellow; last antennal joint and palpi dull black, the front sericeous except the polished narrow orbits, ocellar triangle and the slender stripes bearing the cruciate bristles; the basal three segments of the abdomen lightly dusted. Front nearly square, the uppermost frontal bristle inclinate, the next two divergent, the lowermost two convergent, between the lowermost two is a pair of minute convergent bristles; five pairs of cruciate setulæ; postverticals large. Arista microscopically pubescent, about six times as long as the third antennal joint. Palpi very broad; elbow of proboscis not reaching beyond the epistome. One dorsocentral; mesopleuræ closely fine-hairy and not setulose; one sternopleural. Calypteres minute but with numerous cilia. Halteres black, the knob polished. Wings hyaline; penultimate segment of the fourth vein about one third as long as the ultimate segment and equal to the ultimate segment of the fifth, which is evanescent at the end; second basal and anal cells minute, barely formed.

One specimen, Avon, Idaho, July 26, 1912.

PARAMADIZA new genus.

Front below the ocelli quadrate, one third broader than long; ocellar triangle large, reaching nearly to the frontal suture, before its apex a single pair of cruciate bristles; four fronto-orbital bristles, the lower two convergent, the upper two divergent; postverticals approximate and parallel, strong; frontal suture transversely bisinuate. Face nearly vertical, with two large deep subantennal depressions and strongly carinate medially, the epistome slightly projecting. Cheeks one fourth the eye-height, the vibrissal angle rounded-rectangular; occiput obliquely descending to the vibrissal angle, its ridge with a row of strong bristles; two strong and one weak vibrissæ along the front of the small bucca; eyes rounded, longest vertically. Antennæ small, reaching two thirds the distance to the oral margin, the arista about twice the length of the orbicular third joint, bare. Proboscis short, fleshy; the palpi clavate. Two humeral bristles; two notopleural, one presutural, two supra-alars, one intra-alar, three dorsocentrals in back and one in front of the suture, acrostichals sparse, four scutellars; one sternopleural, one lower and one postero-superior mesopleural in addition to the setulæ, no prothoracic bristles. Scutellum subtriangular, flat, bare. Abdomen with five segments plus the ovipositor, with sparse setulæ. Legs moderately stout, front femora bristly, posterior tibiæ with small apical spurs, but not at all compressed; pulvilli small. Calypteres rudimentary, bare. Costa continuing to the fourth vein, broken beyond the humeral crossvein and before the end of the first vein, at the latter place with two stout bristles and at the humeral break with one similar bristle, base of the costa with two long and strong bristles, costa otherwise not bristly; third vein diverging from the second so as to end at the wing tip; discal cell long, posterior crossvein beyond the middle of the wing and anterior crossvein much beyond the second costal break, the penultimate section of the fourth vein nearly one half as long as the ultimate section and longer than the ultimate section of the fifth vein; basal cells small but evident, the anal vein reaching half way to the margin.

Type species: *Paramadiza washingtona*, new species following.

Paramadiza washingtona new species.

Female.—Length 2.75 mm. Shining black, thorax with sparse hair and fine but long dorsocentrals. Antennæ, palpi and proboscis black; front shining. Tarsi brown. Halteres and calypteres yellow. Wings hyaline, with slight whitish tinge, veins yellowish, their roots paler.

One specimen, Wawawai, Washington.

While this species superficially resembles *Madiza halteralis*, it is very different.

MEONEURA Rondani.

Shining black; the ocellar triangle large, polished, black, the remainder of the front sericeous and often red; a single pair of cruciate bristles, located near the antennæ; postverticals close together and parallel; cheeks sometimes reddish in front; mesonotum very lightly dusted; knob of halteres white; fourth vein very weak, the two crossveins very close together. 1 mm. (Eur.; Alaska,* Id.,* Wash.*) (*Agromyza lacteipennis* Fallen.).....*vagans* Fallen.

SUBFAMILY AGROMYZINÆ.

TABLE OF THE GENERA.

- Arista completely wanting, the third antennal joint large; front shining and closely hairy, no fronto-orbital bristles or oral vibrissæ; eyes large, microscopically pubescent, the cheeks linear; mesonotum close-hairy, bristleless; no sternopleurals, mesopleuræ setulose; scutellum large, triangular, with sharp edge and with two minute apical bristles; legs without spurs or bristles; calypter rudimentary, not ciliate; wings short and broad, the costa extending to the third vein, the second basal fused with the discal cell; auxiliary vein parallel with the first vein, the costa twice broken. (Europe, Africa, Australia, North America.)*Cryptochetum* Rondani.
- Arista present; front rarely shining, rarely pubescent, and always with fronto-orbital bristles present; vibrissæ present; eyes rarely hairy, smaller, the cheeks broader; mesonotum, scutellum and pleuræ provided with macrochætæ; scutellum with rounded edge; tibiæ with apical spurs; calypteres ciliate; wings with the second basal usually distinct from the discal cell, but sometimes fused with the first basal; the costa broken only at the end of the auxiliary vein.....2.
2. Ocellar triangle placed forward on the front, the front usually produced, more or less cone-like, and pubescent; arista pubescent to short-plumose; tibiæ with preapical bristle; mesopleuræ bare; wings pictured, irrorate or fasciate. (North and South America.)

Traginops Coquillett.

- Ocelli placed on the vertex, the front not produced; arista short-pubescent or bare; wings at most with small dark spots.....3.
3. Third antennal joint ovate but with a sharpened end, the arista somewhat thickened; two scutellar bristles. (Europe, Asia, North America.)
Cerodonta Rondani.
- Third antennal joint not ending in a blunt point; four scutellar bristles present4.
4. Cheeks but one sixth the eye-height; two fronto-orbitals; face strongly convex; antennæ scarcely one sixth as long as the head; vibrissæ inserted distinctly above the front border of the oral margin. (North America.)*Hemeromyia* Coquillett.
- Cheeks broader; three or more fronto-orbitals; face not convex.....5.
5. Costa extending to the fourth vein, which is as strong as the third; cheeks receding; wings unspotted; femora not thickened; chaetotaxy variable6.
- Costa extending to third vein only.....8.
6. Posterior crossvein wanting; second, third and fourth veins close together, ending before the tip of the wing, the fifth vein greatly diverging from the fourth. (North America.).....*Antineura* n. g.
- Posterior crossvein present; the fourth vein ending beyond the tip of the wing, the fifth vein not greatly diverging.....7.
7. Ovipositor wedge-shaped, short. (Europe, Asia, Australia, Africa, North America.)*Agromyza* Fallen.
- Ovipositor tube-like, elongate. (Europe, North America.).....*Liriomyza* Mik.
8. Anterior crossvein situated near the base of the wing, the posterior crossvein wanting, or else very close to the anterior; fourth and fifth veins weak, the third vein ending far before the wing-tip; auxiliary vein usually parallel with the first vein.....9.
- Anterior crossvein situated nearly opposite the end of the first vein; posterior crossvein present, and always some distance from the anterior; third vein ending near the wing-tip, the fourth and fifth veins not weaker than the second and third.....10.
9. Posterior crossvein entirely wanting. (Europe, Asia, Africa, North America.)
Phytomyza Fallen.
- Posterior crossvein present, the discal cell minute. (Europe, North America.)
Napomyza Haliday.
10. Hind femora more or less incrassate; vibrissal angle of cheeks prominent; lower occiput reaching forward and bristly; wings usually spotted, at least at the end of the first vein.....11.
- Hind femora not thickened; cheeks receding, the occiput descending straight down; wings not spotted. (Europe, Africa, North America.)
Domomyza Rondani.
11. Mesopleuræ not hairy; postverticals strong; four or five dorsocentrals; two intra-alars; no preapical tibial spurs; femora yellow with preapical spot. (Europe, North America.).....*Odinia* Desvoidy.

Mesopleuræ hairy and with two bristles; no postverticals; four dorsocentrals; one intra-alar; preapical bristle of tibiæ present; femora black. (Europe.)*Neoalticomerus* Hendel.

CRYPTOCHÆTUM Rondani.

The genus *Cryptochetum* is anomalous in any group. The following species were originally described as *Lestophonus*, as a genus of the Oscinidæ. The humeral break of the costa, as well as other characters, suggests the Milichiinæ, but the postverticals are divergent, as in the Agromyzinæ alone. The postverticals are inconspicuous among the erect, short, stiff hairs of the vertex, but can be differentiated as a pair of divergent hairs immediately behind the ocellar triangle.

Penultimate section of the fourth vein one half the length of the ultimate section; fourth and fifth veins not weakened; face, front, mesonotum and scutellum deep blue, rather shining; abdomen shining blue-green; antennæ black, legs blackish; wings grayish hyaline, veins dark brown. 1.5 mm. (Australia, introduced into California.)...*iceryæ* Williston.

Crossveins closer together; fourth and fifth veins slender beyond the crossvein; otherwise as in the preceding species. (Australia, doubtfully introduced into California.).....*monophlebi* Skuse.

TRAGINOPS Coquillett.

Arista almost bare; lunule white, unspotted; sides of front cinereous, with setigerous black spots; thorax similarly spotted, pleuræ bivittate, abdomen brown, spotted; legs yellow, the base of the femora and two rings on the tibiæ brown; halteres yellow; wings hyaline, with numerous rounded brown spots. (Ga., N. J.).....*irrorata* Coquillett.

ODINIA Desvoidy.

Bristles of front and mesonotum arising from brown dots, hairs of notum and abdomen arising from smaller brown dots; front and hind femora with subapical spot; tibiæ with median and apical black rings; wings reticulate with brown. 4.3 mm. (Ga.).....*picta* Loew.

Body cinereous, not with setigerous spots; wings not reticulate.....2.

2. Wings immaculate; tibiæ brown; sternopleura and a spot above it brown; disk of mesonotum without acrostichal setulæ; abdomen dark brown. 1.5 mm. (N. H.).....*immaculata* Coquillett.

Acrostichals present; crossveins at least clouded; tibiæ with one or two rings; pleuræ bivittate; abdomen with paired spots.....3.

3. Front pubescent, reddish above antennæ; acrostichals not seriatly arranged, but eight to ten on the suture; both crossveins dark brown; fifth vein reaches the wing-margin. 4 mm. (Eur.; Mich.)...*maculata* Meigen.

Front nearly or quite bare, usually entirely gray; acrostichals in evident rows, on the suture six rows; crossveins but little clouded; fifth vein scarcely reaches the wing-margin. 2 mm. (Eur.; Mich.)

boletina Zetterstedt.

CERODONTA Rondani.

Largely yellowish species, the disk of the mesonotum cinereous black, more or less marked with two paler vittæ and with a yellowish spot before the scutellum; pleuræ mostly yellow; scutellum yellow in the middle; legs yellow, the tarsi brownish. 2 mm. (Mass.* N. H., D. C., N. J., W. Ind., La.,* Ind., Ill.,* Tex.*) (*Ceratomyza*.)*dorsalis* Loew.

Mostly black; the mesonotum subshining black to the black scutellum, not vittate; pleuræ mostly black; legs black or blackish, the femora more or less yellow. 2.5 mm. (Eur.)* Mont.)* Wyom.)* Id.)* Wash.)* B. C.)* Ore.)* Cal.)**femoralis* Meigen.

HEMEROMYIA Coquillett.

Black, the face and cheeks yellow, the antennæ, palpi and halteres brownish; ocellar triangle and the orbits slightly polished; four dorsocentrals; sections of the fifth vein proportioned one to five, the anterior cross-vein at three fourths the length of the discal cell. 1.5 mm. (N. Mex.)

obscura Coquillett.

ANTINEURA new genus.

Related to *Agromyza*, but the discal cell is open outwardly. Four fronto-orbitals, the lower three convergent; cheeks receding, about one third as deep as the eye-height; proboscis short and fleshy; arista bare, a little more than twice the length of the third antennal joint, its basal segment thickened. Mesonotum pollinose or shining; one anterior and three posterior dorsocentrals, two rows of sparse acrostichals; four scutellars; one sternopleural; two mesopleurals. Costa continuing to the fourth vein, broken only at the end of the first vein; the auxiliary vein rudimentary, confluent with the first vein along the middle of its course; second, third and fourth veins equally strong, parallel, located in the anterior part of the wing, the fourth vein ending before the wing tip; posterior crossvein entirely wanting, the anterior crossvein before the costal break; the vein between the first and second basal cells weak; only the base of the anal vein evident; the fifth vein gently curved, diverging from the fourth and ending at the middle of the hind margin of the wing, gradually evanescent, but its base as strong as the other longitudinal veins.

Type species: *Antineura togata*, following.

TABLE OF SPECIES OF *Antineura*.

- Mesonotum, except the notopleural suture, pleuræ and abdomen entirely shining black; legs black except the knees. 1.2 mm. (Wash.)*
chlamydata n. sp.
- Mesonotum, pleuræ and abdomen more or less yellow, the mesonotum pol-
 linose; legs largely yellow.....2.
2. Largely yellow, the mesonotum, except the sides and hind margin black,
 center of sternopleuræ and bases of abdominal segments brownish.
 1.5 mm. (N. Mex.) (*Phytomyza*).....*palliat*a Coquillett.
- Largely black, the sides and posterior angles of the mesonotum, the sides of
 the scutellum and the abdominal segments, except their outer margin,
 yellow; most of the pleuræ blackish. 1.2 mm. (Wash.)...*togata* n. sp.

***Antineura chlamydata* new species.**

Male.—Length 1.2 mm. Black, the front and vertex, except the ocellar triangle, the face, cheeks, antennæ, notopleural suture and the halteres yellow. Clypeus black, the balance of the mouthparts yellowish. Cheeks about one fourth as deep as the eye-height, but broader behind. Mesonotum highly polished, jet black, the humeri and a rather broad extension above the notopleural suture towards the root of the wings yellow, the posterior angles black like the notum; middle of scutellum broadly yellow, pleuræ black. Abdomen entirely shining black, hairy. Legs black, the knees a little brownish. Halteres yellow. Wings hyaline.

One specimen, Oroville, Washington, May 1, 1912.

***Antineura togata* new species.**

Length 1.2 mm. Head yellow, the occiput, ocellar triangle, clypeus and arista blackish, proboscis, palpi and antennæ yellow. Mesonotum opaque cinereous black, the sides and posterior angles yellow; middle of scutellum yellow; pleuræ blackish in ground color, but the sutures and an oblique line crossing the mesopleuræ broadly yellow. Abdomen subshining black, the hind margins of the segments bright yellow, the fifth segment largely yellow; in the female the very short sixth segment is yellow and the seventh segment is elongate, round-triangular, polished jet black and with four long marginal bristles. In the male apparently the sixth segment terminates the abdomen, and is rounded, microscopically pubescent and of the same piceous black color as the bases of the other segments. Legs of the female yellow except the dusky tarsi; of the male the tibiæ and tarsi are infuscated. Halteres pale yellow; wings hyaline.

One male, Pullman, Washington, May 12, 1912; and one female, Alмота, Washington, June 24, 1911.

Agromyza Fallen.

TABLE OF THE SPECIES OF *Agromyza* Fallen, INCLUSIVE OF *Domomyza* Rondani AND *Liriomyza* Mik.

- Halteres black; black or metallic species; ocellar triangle elongate and polished; frontal orbits polished; auxiliary vein ending in or close to the first vein.....2.
- Halteres whitish or yellow; ocellar triangle small and opaque; frontal orbits usually not differentiated; auxiliary vein usually ending independently in the costa.....15.
2. Calypter and its hairs white; metallic species.....3.
 Calypter margined with black, its hairs dusky.....6.
3. Lower part of face in profile receding; veins black; the fourth vein diverging from the third.....4.
 Lower part of the face projecting; veins subfuscous; fourth vein straight. (Pa.,* Mass.,* N. J.,* Ont., Ill.,* Ga., La.,* Tex.,* Wyom.,* Cal., Id.)
virens Loew.
4. Costa evanescent beyond the tip of the third vein; wings broad; cheeks broad. (Wash.*).....(*Domomyza*) *tamia* n. sp.
 Costa reaching the fourth vein; wings normal; cheeks narrow. (*aneiventris* Fallen.)5.
5. Last two segments of the fourth vein proportioned 1:3; the fourth vein ends beyond the wing-tip; the segments of the fifth vein 3:2. (Eur.)* N. Y.,* N. J., W. Ind., Ga., N. Mex., Cal.,* Id.,* Wash.*)
aneiventris Fallen, sens. str.
 Segments of the fourth vein proportioned 1:4; the fourth vein less divergent from the third; segments of the fifth vein 1:1. (Eur.)* Cal.,* Wash.*)*aneiventris* var. *cunctans* Meigen.
6. Metallic species; segments of fourth vein 1:3; segments of the fifth vein 3:2; face not receding. (Eur.)* Id.,* Wash.*)..*pseudocunctans* Strobl.
 Shining black species; segments of the fourth vein proportioned 1:4 to 1:87.
7. Sixth vein very evident and reaching nearly to the margin of the wing. (Eur., Afr., Asia; Mass.).....*schineri* Giraud.
 Sixth vein not very evident, and always abbreviated.....8.
8. Male with a conspicuous curved tapering bunch of oral vibrissæ; lower angle of the face of ♂♀ conspicuously produced; four frontal bristles; pubescence of frontal orbits sparse and inconspicuous; face subtuberculate between the antennæ. (Eur.)* Mass.,* Ill.,* La.,* Id.,* Wash.*)*curvipalpis* Zetterstedt.
 Oral vibrissæ but one or two in number and not bunched; vibrissal angle not produced9.
9. Middle tibiæ with two bristles on the extensor side; no vibrissal angle to the face; front largely yellow; four fronto-orbitals; frontal orbits linear and nearly bare; arista five times as long as the third antennal

- joint; seventh segment of ♀ abdomen depressed; auxiliary vein ending close to the end of the first vein, but independently in the costa; the sections of the fourth vein 1:4. 3 mm. (Hayti.*)...*diadema* n. sp.
- Tibiae without extensor bristles; face less receding; front black; the orbits broader; arista less than four times the length of the third joint; last segment of ♀ abdomen compressed; auxiliary vein ending in the first vein. (*maura* Meigen.)10.
10. Ocellar triangle longer than wide, its sides concave; the four lower frontal bristles close together, the fifth (uppermost) separated by a greater interval; sections of the fifth vein equal. (Proc. Ent. Soc. Wash., IX, 35 (1908).) (Mo., Que.,* Cal.).....*maura* var. *tilia* Couden.
Not with this combination of characters.....11.
11. Segments of the fifth vein 1:1; segments of fourth vein 1:10; tip of epistome sometimes visible in profile view; orbital pubescence very short, almost invisible; six frontal bristles; face carinate, its oral margin nearly straight. (Eur.; Ont., Ga.,* Pa., N. Y.,* N. J., Mass., Ill.)*.....*maura* var. *simplex* Loew.
Basal sections of fifth vein longer than the apical section; crossveins less approximated; face receding or vertical, the lower angle rounded in profile; orbital pubescence usually dense and longer.....12.
12. Face short and strongly tuberculate between the antennæ, the epistome strongly emarginate; the lower two fronto-orbitals alone present; pubescence of frontal orbits very dense. (Eur.)* Id.,* Wash.*)
maura var. *nasuta* n. var.
Face carinate, not shortened, the margin of the epistome less vaulted; the upper fronto-orbitals present; orbital pubescence less dense.....13.
13. Seven fronto-orbital bristles; wings broadly rounded; segments of fourth vein 1:4. (Id.,* Wash.)*.....*maura* var. *setifrons* var. nov.
Four frontal bristles; segments of fourth vein 1:6 to 1:8.....14.
14. Third vein ending near the tip of the wing, nearer the second than the fourth vein; segments of fourth vein 1:6; sixth vein faint. (Eur.)* Id.,* Wash.)*.....*maura* Meigen, sens. str.
Third vein equidistant from the second and fourth; the fourth vein ending nearer the tip of the wing; crossveins more approximated, the segments of the fourth vein 1:8; sixth vein usually wanting. (Eur.)* Wash.)**maura* var. *morionella* Zetterstedt.
15. Thorax not bordered with yellow at the sides, at most a very narrow line present on the notopleural suture.....16.
Thorax with distinct yellow lateral borders, extending more or less broadly along the notopleural suture.....40.
16. Third antennal joint black.....17.
Third antennal joint yellow or ferruginous.....34.
17. Palpi black18.
Palpi yellow33.
18. Front, face and cheeks yellow, at most the upper orbits darkened.....19.

- Head wholly or mostly black; thorax at most lightly pruinose (if the frontal orbits are yellow compare *superciliosa*).....22.
19. Notum and pleuræ pollinose, not shining; penultimate section of the fourth vein much shorter than the ultimate section of the fifth vein.....20.
- Thorax shining, very lightly pollinose; legs entirely black; the penultimate section of the fourth vein nearly as long as the ultimate section of the fifth; four strong dorsocentrals; calypteres and fringe yellow; bristles of the head strong. 2 mm. (Mont.*).....*rutiliceps* n. sp.
20. Discal cell long and narrow, the anterior crossvein beyond the end of the first vein; knees sharply yellow; four strong dorsocentrals; five fronto-orbitals; fringe of calypteres blackish; wings slender, the veins strong. 2-3 mm. (Mont.,* Id.,* Wash.*).....*genualis* n. sp.
- Discal cell shorter; the anterior crossvein before the end of the first vein; legs entirely black.....21.
21. Dorsocentrals strong. 2 mm. (Ent. News, XXIII, 463 (1912).) (Ind.)
davisii Walton.
- Dorsocentrals weak, hardly longer than the notal setulæ; last segment of ♀ abdomen longer than the second, third and fourth segments together, compressed, jet black. 2 mm. (Col.,* Id.*).....*auriceps* n. sp.
22. Black, the abdomen especially greenish; two dorsocentrals; the segments of the fifth vein 3:2; anterior crossvein at one third the length of the discal cell. (D. C., Mass., Ga., W. Ind., Wisc., S. Dak.)
viridula Coquillett.
- No trace of metallic coloring; anterior crossvein near or beyond the middle of the discal cell23.
23. Large bristly species, usually with five strong frontal bristles and with one or two dorsocentrals before the suture; front very broad and uniformly opaque; calypteres dark, with bushy black fringe; antennæ brown at base; basal cells separate. (D. C., Mass.,* N. Y., Fla., W. Ind., La., Col., N. Mex., Cal.).....*setosa* Loew.
- Less bristly species, not more than four dorsocentrals; antennæ black; calypteres white24.
24. Costa interrupted at the third vein or much thinned between the third and fourth veins; mesonotum lightly pruinose and subshining; usually a small dorsocentral in front of the suture.....25.
- Costa continuing to the fourth vein; as far as known, the calypteres entirely white and fringed with white hairs; rarely with four dorsocentrals27.
25. Calypteres fringed with white hairs; costa entirely interrupted at the third vein. (*nigripes* Meigen.)26
- Calypteres fringed with white hairs; costa faint beyond the third vein; discal cell moderately large; sections of the fourth vein 1:3, of the fifth vein 3:2; front tibiæ and all the tarsi sometimes brownish. (Eur.,* Id.,* Wash.,* Ore.*).....*reptans* Fallen.
26. Sections of fourth vein 1:3, of the fifth vein 3:2. (Eur.,* S. Dak.,* Wash.*).....*nigripes* var. *cinerascens* Macquart, Strobl.

- Sections of the fourth vein 1:4, of the fifth vein subequal. (Eur. ; * Col. *)
nigripes Meigen, sens. str. Schiner.
27. Second section of the costa about three times as long as the third section; fourth vein diverging from the third and ending much beyond the wing-tip; discal cell large, the segments of the fifth vein 3:2; wings broad; third antennal joint very small, the arista long, slender and pubescent28.
 Second section of the costa about four times as long as the third section; arista short, stout at base, and apparently bare.....29.
28. Front broader, about one third the width of the head, brownish; abdomen black; frontal bristles fine. (D. C., N. J., Mass., Ont., Ill., * Wisc., * La., * Kans., Tex. *)*parvicornis* Loew.
 Front narrower, less than one third the width of the head, the frontal lunule with a rounded white spot; abdomen black, in the ♂ the last few segments yellowish; frontal bristles robust. (Pa., Mass., * N. H., Fla., Ill., * La., * S. Dak. *)*terminalis* Coquillett.
29. Discal cell large, the segments of the fifth vein 3:2; fourth vein ending far beyond the wing-tip, its segments about 2:5; four dorsocentrals; thorax lightly pollinose. (Eur. ; * Id., * Wash., * Ore. *)*reptans* Fallen.
 First section of the fifth vein not greatly longer than the outer section; tip of the wing near the middle of the first posterior cell, the third and fourth veins subparallel.....30.
30. Discal cell smaller than usual, the basal section of the fifth vein much shorter than the outer section; the sections of the fourth vein about 1:5; root of the wing and the notopleural suture narrowly whitish; at least the front knees yellow.....31.
 Basal section of the fifth vein longer than or subequal to the outer section; the sections of the fourth vein about 1:3.....32.
31. Scutellum broadly yellow in the middle; interfrontalia yellow. (Wash. *)
interfrontalis n. sp.
 Scutellum black; interfrontal sutures often striped with yellow above, but otherwise the front is black. (Eur. ; * Mass., * Id., * Wash. *)
luctuosa Meigen.
32. A narrow yellow sutural line along the sides of the thorax, expanding beneath the root of the wing; knees, front tibiae and the tarsi more or less yellowish; frontal lunule white-pollinose; wings broader. (Pa., N. J., Mass., * Wisc., Ill., * La., Wash. *)*angulata* Loew.
 Thorax not marked with a lateral yellow line; legs generally darker; front opaque black; wings narrower. (Nebr., Mass., * D. C., Va., Fla., W. Ind., La., Tex., Ill., * Wisc., * S. Dak., Wash., * Alaska.)*neptis* Loew.
33. Front broader than long, black, but yellow below; antennae entirely black; penultimate section of the fourth vein about one third as long as the ultimate section of the fifth vein. (W. Ind.)*anthrax* Williston.
 Front mostly yellow; base of the antennae yellowish; penultimate section of the fourth vein two thirds as long as the ultimate section of the fifth

- vein; wings rather narrow. (D. C., Mass., La.,* Wisc.,* Ill.,* Kans., S. Dak., Tex.,* Col., Wyom.).....*longipennis* Loew.
34. Four dorsocentrals; face and cheeks largely or wholly yellow; palpi yellow35.
Two or three dorsocentrals; mesonotum subshining.....38.
35. Basal section of the fifth vein much shorter than the apical section, the anterior crossvein before the end of the first vein; knees not yellow; thorax opaque pollinose; three fronto-orbitals; cheeks one third the eye-height; antennæ infuscated above. (Eur.;* Id.,* Wash.*)
perpusilla Meigen.
Sections of the fifth vein subequal; knees conspicuously yellow.....36.
36. Third and fourth veins strongly diverging at the tip, veins brown; mesonotum rather densely whitish-gray pruinose; lower half of the frontal vitta yellow. 2.5 mm. (Col.).....*pruinosa* Coquillett.
Third and fourth veins parallel, their tips but little diverging; front mostly yellow37.
37. Front yellow, a central spot sometimes blackened; mesonotum subshining; veins rather weak; three fronto-orbitals; cheeks one sixth the eye-height; antennæ more or less infuscated, the arista black. (D. C., Mass., La.,* Ill.,* Wisc.,* Kans., S. Dak., Tex., Col., Wyom.)
longipennis Loew.
Front yellow; mesonotum opaque pollinose; veins brown; four to six fronto-orbitals; cheeks one third the eye-height; antennæ pale yellow, the arista yellow at the base. (Alaska.).....*pollinosa* n. sp.
38. Front narrow, uniformly brownish or black; face and cheeks black; third antennal joint minute; hairs of the mesonotum arranged in rows; wings broad, the segments of the fifth vein 3: 2. (D. C., N. J., Mass.* Ont., La.,* Kans., S. Dak.,* Tex.*).....*parvicornis* Loew.
Front black above, yellow below; face and cheeks yellow.....39.
39. Tarsi black, sometimes the metatarsi yellowish; acrostichal hairs in rows; hairs of calypteres dusky; four fronto-orbitals; basal section of the fifth vein longer than the apical section. (Eur.; Id.,* Wash.*)
sulphuriceps Strobl.
Metatarsi yellow; hairs of mesonotum irregularly placed; sections of the fifth vein subequal. (D. C.).....*varifrons* Coquillett.
40. Front above lunule mostly or entirely black; face black; fringe of calypteres white; legs black; antennæ black. (In *superciliosa* the calypteres have a dark fringe.).....41.
Front largely or wholly yellow; usually the face and always the cheeks yellow48.
41. Side stripes of the thorax broadly yellow; scutellum, upper pleuræ, rear of mesonotum, and base of abdomen, yellow.....42.
Yellow stripes of thorax narrower; almost entirely black species.....43.
42. Mesonotum opaque; sections of the fifth vein equal; frontal lunule yellow; costa ending at third vein. (S. Am., W. Ind.)
xanthophora Schiner, Williston.

- Mesonotum polished; last section of the fifth vein shorter than the preceding section; front black; four dorsocentrals. (Mex.)
picta Coquillett.
43. Sides of front yellow along the orbits; knees broadly yellow; hairs of calypteres black; fourth vein ending at wing-tip, wings broad. (Eur.;* Wash.,* Ore.).....*superciliosa* Zetterstedt.
 Frontal orbits black; knees narrowly yellow; hairs of calypteres pale; fourth vein ending usually beyond the wing-tip (compare also *luctuosa* in couplet 31).....44.
44. Apical segments of ♂ abdomen yellow; wings broad, the third and fourth veins somewhat divergent, the fourth vein ending much beyond the wing-tip; frontal lunule marked with a small white dot; arista long and pubescent. (N. H., Pa., Fla., La.,* Ill.,* S. Dak.)*
terminalis Coquillett.
 Abdomen black, the incisures more or less yellow; the third and fourth veins subparallel, the fourth vein ending at or slightly beyond the wing-tip45.
45. Arista more than two times the length of the antenna, plainly pubescent, the antennæ short; wings broad; frontal lunule white-pollinose. (Mass.,* N. J., Pa., La., Ill.,* Wisc., Wash.)*.....*angulata* Loew.
- Arista shorter, bare; wings narrow.....46.
46. Antennæ large, porrect, the arista thick; sections of the fifth vein subequal; scutellum black47.
 Antennæ small, the arista slender; discal cell small, the sections of the fifth vein 1:2; scutellum yellow. (Wash.)*.....*interfrontalis* n. sp.
47. Antennæ strikingly large; thorax pollinose; four dorsocentrals; frontal lunule often yellow. (*magnicornis* Loew.) (Eur.;* Mass., N. J., Pa., Ga., Ill.,* Wisc.,* S. Dak., Col., Wash.)*..*grossicornis* Zetterstedt.
 Antennæ not abnormal; thorax subshining; four or three dorsocentrals; frontal lunule black. (Proc. Ent. Soc. Wash., VI, 191, 1904.) (Cal.,* Ore.,* Wash.,* Alaska.)*.....*taniola* Coquillett.
48. Antennæ black, at least the third joint black.....49.
 Antennæ entirely yellow, sometimes the end of the antenna may become infuscated above54.
49. Front entirely yellow, or centrally yellow; fringe and margin of the calypteres dusky50.
 Center of front above lunule velvet black, bordered with yellow on the sides; wings narrow, the penultimate section of the fourth vein one third as long as the ultimate section and longer than the posterior crossvein, the sections of the fifth vein subequal; calypteres and fringe white; pollinose species. (Mass., D. C., Ind.,* Ill.)*..*marginata* Loew.
50. Plump shining black species, with black antennæ and legs; front narrower than long; two or three dorsocentrals. (*platyptera* Thomson.)....51.
 Notum pruinose; front square; four dorsocentrals.....53.
51. Frontal orbits black, at least above; subantennal grooves more or less

- blackish. (Pa., Mass.,* N. Y.,* N. J., Ill.,* Wisc., La., N. Mex., Col., Id.,* Wash,*) *platyptera* var. *coronata* Loew.
- Front entirely yellow, not bordered with black; face yellow.....52.
52. Lateral yellow stripe of the thorax extending beneath the wings. (*malva* Burgess.) (Wisc., N. H., N. J., D. C., Fla., W. Ind.,* Ga., La.,* Ill.,* Mo., Tex.,* Col.).....*platyptera* var. *jucunda* Wulp.
- Lateral stripe extending above the root of the wings. (*lateralis* Williston, 1896, and not of Macquart, 1835, from Europe.) (W. Ind.)
platyptera var. *allecta* nom. nov.
53. Base of antennæ, scutellum, a prescutellar spot, pleuræ, abdomen, and legs mostly yellow; anterior crossvein opposite or beyond the end of the first vein. (Wash.,* Alaska,*).....*pacifica* n. sp.
- Mostly black species, the whole of the antennæ, the mesonotum except the sides, the scutellum except the tip, the abdomen, and much of the pleuræ and legs black; anterior crossvein before the end of the first vein. (2 mm. (Id.)*).....*varia* sp. nov.
54. Scutellum entirely black; thorax opaque black, the abdomen black, except at sides and sometimes the incisures.....55.
- Scutellum yellow, at least in the middle.....57.
55. Legs, antennæ, cheeks, face and lower part of the front whitish; sections of the fourth vein about 1:10; mesopleuræ yellow. (Wash,*)
clara n. sp.
- Legs blackish, antennæ somewhat infuscated; face, front and cheeks yellow; sections of the fourth vein about 1:6; pleuræ largely cinereous.56.
56. Knees not differentiated; three fronto-orbitals. (Eur.,* Id.,* Wash,*)
perpusilla Meigen.
- Knees yellow. (Greenland.).....*arctica* Lundbeck.
57. Palpi large, projecting; scutellum with two bristles; thorax reddish, abdomen brown, its base yellowish; legs yellow, the hind femora tipped with black; penultimate section of the fourth vein longer than the last section of the fifth vein. (W. Ind.).....*innominata* Williston.
- Palpi small; four scutellar bristles; four dorsocentrals; mesonotum more or less black; penultimate section of the fourth vein much shorter than the last section of the fifth vein.....58.
58. Notum pruinose, pleuræ and abdomen but little shining; cheeks nearly as deep as the width of the eye. (If the cheeks are narrow compare *perpusilla* and *pacifica*.) (Id.)*.....*lima* n. sp.
- Shining or subshining; cheeks relatively narrow.....59.
59. Usually broader and larger; mesonotum with a quadrate yellow spot in front of the scutellum; front usually square; sections of the fifth vein 2:360.
- Smaller and more slender; mesonotum black to the scutellum; front narrower than deep; sections of the fifth vein more nearly 1:2. (*Scutellata* Fallen.).....63.
60. Ovipositor long, tubular, equalling three abdominal segments in length. (W. Ind.)*.....(*Liriomyza*) *tubifer* n. sp.

- Ovipositor short, wedge-shaped, about as long as the other abdominal segments. (*melampyga* Loew.)61.
61. Tibiæ and tarsi wholly black, the femora yellow varied with black; abdominal segments fasciate with black and yellow. (N. Y., N. Mex.)
melampyga var. *flavonigra* Coquillett.
Femora, tibiæ and tarsi largely yellow; abdomen not conspicuously fasciate62.
62. Genitalia shining black, contrasting with the abdomen. (*flaviventris* Johnson, 1902, and not of Strobl, 1898, which is *grossicornis* Zetterstedt.) (D. C., Mass.,* N. H., N. Y., N. J., La., Wisc.,* Col., Wyom., N. Mex.*)*melampyga* Loew, sens. str.
Genitalia concolorous with the yellow-brown abdomen. (W. Ind., Bolivia,* Tex.,* Ill.*)*melampyga* var. *sorsosis* Williston.
63. Abdomen black above, the sides not yellowish, but the incisures somewhat yellow64.
Sides of the abdomen somewhat yellow66.
64. Discal cell very small, coextensive with the auxiliary cell, the second and third sections of the fourth vein about 1:10; legs with at least the femora yellow; antennæ yellow, sometimes dusky at the tip. (Eur.;* Mass.,* Ill.,* La.,* Tex.,* Id.,* Wash.*)...*scutellata* Fallens, sens. str.
Discal cell surpassing the auxiliary cell, the sections of the fourth vein about 1:8; legs darker65.
65. Legs, including the femora, somewhat infuscated. (*brassica* Riley.) (Eur.;* U. S.)*scutellata* var. *pascuum* Meigen.
Legs black except the knees; third antennal joint somewhat darkened at the tip. (Eur.;* Afr.; Id.,* Wash.*)...*scutellata* var. *orbona* Meigen.
66. Legs mostly yellow; usually larger species. (Eur.;* Wash.,* Cal.)*
scutellata var. *variegata* Meigen.
Legs black except the knees; third antennal joint darkened at the tip. (*picella* Thomson.) (Eur.;* Id.,* Wash.,* Ore.,* Cal.)
scutellata var. *puella* Meigen.

Domomyza tamia new species.

♂♀. Length 2.75 mm. Blue-black species with black halteres; face receding in profile; wings broad, veins black, the costa evanescent beyond the third vein; calypteres white and fringed with white hairs. Black, with metallic blue and green reflections. Head dull black, not metallic; front as broad as high, opaque blackish, no lateral shining stripes, the usual shining portion around the ocelli blunt in front, not triangular, seven fronto-orbital bristles, the orbital pubescence, *i. e.*, that between the bristles and the eyes, comparatively long and dense; mouth-opening greatly arched, so that the end of the clypeus is directly under the antennæ, the face thereby appearing to recede in profile, the face rather sharply carinate by the descending lunule, the antennal grooves deep; cheeks two thirds as deep as the eye-height, the hairs along the oral margins not conspicuous. Antennæ small and black, the outer joint not

longer than the inner, the arista one and one half times as long as the antenna. Proboscis short, black, its labella sometimes dusky; palpi small, narrow, straight and with a single terminal hair. Thorax, scutellum and abdomen metallic green or blue, three pairs of long dorsocentrals, the pubescence normally fine; abdomen highly polished, last segment of female long, triangular, jet black. Halteres black, calypteres entirely whitish and with white hairs. Legs black, subshining. Wings broad, hyaline, veins black, the costa thickened and vaulted in front of the marginal cell, and vanishing beyond the end of the third vein; third vein ending slightly in front of the tip of the wing, the fourth vein somewhat diverging from the third and ending beyond the wing apex; discal cell relatively broad, the anterior crossvein slightly beyond its middle; outer segments of fourth vein proportioned one to four, segments of fifth vein four to three.

One male and five females, Wawawai, Washington, May 20, 1911.

This species might well be assigned to Rondani's genus *Domomyza*, the other species of which are evidently related to the second group of *Agromyza*, with pale halteres. The present species shows such close relationship to the *ænciventris* group that it should not be separated from these species merely because of an abbreviation of the costa. The species *Agromyza reptans* Fallen and *nigripes* Meigen frequently exhibit a thinning away of the costa beyond the third vein and such individuals could very well be classified as *Domomyza*.

Agromyza diadema new species.

Female.—Length 3 mm. Polished black, the front and lunule yellow, notopleural and meso-pteropleural sutures very narrowly yellowish. The yellow of the front becoming brown on the upper part, but clearly differentiated from the black orbits and the small ocellar triangle; sides of ocellar triangle convex. Four reclinate fronto-orbitals, uniformly spaced, the space between them and the eye unusually narrow and nearly devoid of hairs. Face strongly receding, no vibrissal angle, cheeks one fifth the eye-height, a single oral vibrissa; in profile the front edge of the clypeus is visible; center of face flattened, scarcely carinate nor grooved, the edge of the epistome shallowly arched. Antennæ nearly reaching the margin of the epistome, the almost bare arista five times the length of the third joint. Palpi and proboscis black, the former broad, but not reaching beyond the oral opening.

Two dorsocentrals, about eight rows of acrostichals, one presutural, two notopleural, two sternopleurals, one strong mesopleural. Last abdominal segment jet black, flattened, a little longer than the preceding segment, the projecting ovipositor slender, enlarged apically, its upper and lateral edges serrate. Middle tibiæ with a bristle on the postero-extensor edge below the middle and a smaller one just above. Calypteres whitish, the margin and fringe black. Halteres black, their roots paler. Wings hyaline, veins strong; costa thick-

ened at the junction of the first vein; auxiliary vein separate from the first vein, but closely approaching it near the tip; basal section of front edge of the discal cell twice as long as the other section, the latter nearly equalling the posterior crossvein, and about one fourth the length of the ultimate section of the fourth vein; sections of the fifth vein three to two; anal vein faint; the third section of the costa nearly equal to the fourth and about one fifth the length of the second section.

One specimen, Hayti.

While the auxiliary vein ends independently in the costa, it approaches very closely to the first vein near its end. Its course is thus quite different from that found in the lighter colored species of *Agromyza*.

***Agromyza maura* var. *setifrons* new var.**

Male.—Seven fronto-orbital bristles, orbital pubescence long; crossveins not approximate, the outer segments of the fourth vein proportioned about one to four, discal segment of the fifth vein a little longer than the last segment; third vein uniformly curved backward so that it diverges from the second and ends almost at the wing tip, fourth vein ending considerably beyond the tip of the wing; wings broadly rounded; four sternopleural bristles in the upper series; abdomen black.

One male, from Troy, Idaho, June 14, 1908, collected by William M. Mann.

The variations of *maura* indicate permutations of the characters rather than phyletic segregations. The differences between *maura* and *morionella*, as stated by authors and repeated in the table, do not exactly tally on the score of European specimens before me. The varieties named in the table are distinct enough in their sets of characters, but probably additional specimens from other localities will disclose other combinations lessening the definiteness of varietal limits.

***Agromyza maura* var. *nasuta* new var.**

Male.—Length 2 mm. Ocellar triangle long, its sides concave, the polished frontal orbits with numerous hairs, only the convergent lowermost two fronto-orbital bristles present. Face with a prominent tubercle present between the antennæ in lieu of a carina, the subantennal grooves deep; vibrissal angle projecting, as is also the greatly excised edge of the epistome. Antennæ reaching below the middle part of the excision of the epistome, the arista three times as long as the last joint. Palpi slender, somewhat curved, but not flattened. Second section of the costa less than four times as long as the third, which is subequal to the fourth section; anterior crossvein at two

thirds the length of the discal cell, the segments of the fourth vein about one to five, the basal section of the fifth vein longer than the outer section.

I have sixteen specimens before me, all males, from Troy, Idaho, Pullman, Washington, and Steiermark, in Europe. The last mentioned were received from Professor Strobl. This variation is most nearly related to *curvipalpis*; it is not the true *maura* nor *morionella*, the males of which have a carinate face and the full set of fronto-orbital bristles.

Agromyza rutiliceps new species.

Male.—Length 2 mm. Shining black, very lightly dusted, the front and vertex except the ocellar triangle and the upper orbits, the face, cheeks, labella, very narrow line on the notopleural suture, halteres, calypteres and their fringe, and the base of the wings reddish to yellow. Antennæ and palpi black. Bristles of head and thorax very long, the ocellar bristles reaching nearly to the antennæ; four pairs of fronto-orbitals; four dorsocentrals, one of them pre-sutural. Abdomen with short close hairs, none of the incisures pale, hypopygium small, concolorous. Legs entirely deep black. Wings hyaline, veins narrowly black, the fourth vein ending beyond the wing tip, its penultimate section one third the length of the ultimate, one and one half times the length of the posterior crossvein and three fourths the length of the ultimate section of the fifth vein; anterior crossvein beyond the end of the first vein.

One specimen, sent in some grass sweepings by William M. Mann, who collected it at Nigger Hill, Powell County, Montana, July, 1912.

Agromyza genualis new species.

♂♀. Length 2.5–3.5 mm. Black, the front, face, cheeks, lower occipital orbits, narrow line bounding the mesopleuræ above and behind, the halteres, calypteres and root of wing, a transverse line below the scutellum, the knees and some of the incisures of the abdomen yellow. Upper frontal orbits and the ocellar triangle blackish. Antennæ and palpi black. Bristles strong, five or six fronto-orbitals, the uppermost somewhat distant from the others, on the orbits besides the fronto-orbitals a row of close minute hairs; ocellar bristles reaching about two thirds the distance to the antennæ; two vibrissæ. Cheeks about one fourth the eye-height. Thorax opaque black, dusted, the bristles and setulæ strong; four dorsocentrals, of which one is in front of the suture; four rows of acrostichals and numerous lateral setulæ present; pleuræ pollinose, meso- and sternopleuræ setulose, one sternopleural and a row of four mesopleural bristles longer, prothoracic bristle large. Abdomen subshining, in the female the hind margin of the fifth segment alone is narrowly yellow, sixth segment of female broad, depressed; male abdomen entirely black, the hypopygium somewhat larger than the distal segments, globular, deeply excised and

with two black linear lamellæ. Legs stout, black, the knees sharply marked with yellow. Fringe of calypteres black. Wings narrow, hyaline, veins strong, the third section of the costa one and one half times the fourth; anterior crossvein beyond the end of the first vein, segments of discal cell two to one, the penultimate section of the fourth vein about one sixth the ultimate, shorter than the posterior crossvein and about two fifths the length of the ultimate section of the fifth vein.

Four males and three females. Powell County, Montana (Wm. M. Mann); Moscow Mountain, Idaho; Mount Constitution, Washington.

Agromyza auriceps new species.

♂♀. Length 2 mm. Black, pollinose, the occiput, thorax and abdomen with grayish tinge, the legs black. Interfrontalia, face, cheeks, labella, halteres and the narrow incisures of the abdomen yellow. Antennæ and palpi black. Vibrissal ridge brown; clypeus black. The narrow frontal orbits black, gradually merging into yellow anteriorly; four fronto-orbitals; ocellar bristles reaching half way to the antennæ. Thoracic setulæ rather fine and long, about four rows of acrostichals; the dorsocentrals scarcely differentiated from the setulæ, except the posterior pair. Notopleural suture very narrowly yellow; a narrow triangular yellow mark descending on the meso-pteropleural suture; one posterior sternopleural and one posterior mesopleural bristle. Calypteres dirty yellow and with blackish fringe. The penultimate segment of the male abdomen somewhat shining, the hypopygium small, globular, its parts not projecting; in the male the incisures of the venter also rather narrowly but uniformly yellow; in the female the incisures of the basal four segments very narrowly of the penultimate segment rather broadly yellow, the ultimate segment shining jet black, compressed, and as long as the preceding three segments together; hairs of the abdomen rather conspicuous, the membrane between the sternites and the tergites yellow. Wings hyaline, veins blackish, rather strong, the second section of the costa two and one half times the third, which is equal to the fourth, the ends of the third and fourth veins diverging; anterior crossvein before the middle of the discal cell, the penultimate section of the fourth vein about one fourth the ultimate and a little longer than the posterior crossvein; the ultimate section of the fifth vein slightly longer than the penultimate section; anal vein strong, nearly reaching the wing margin.

Five males and six females, Moscow Mountain, Idaho; one female, Colorado (C. F. Baker, collector).

This species is probably closely related to *Agromyza Davisii*, recently described by Walton, but can scarcely be the same on account of its weak thoracic bristles.

***Agromyza interfrontalis* new species.**

Female.—Length 1.7 mm. Black, subshining, the center of the front, labella, scutellum except the anterior angles, upper mesopleural sutures, calypteres and root of wings, halteres, and rather narrowly the knees, yellow; laterally the incisures of the basal segments of the abdomen becoming yellowish, and the penultimate segment with an apical yellow band. Front becoming narrower towards the antennæ, the orbits relatively broad and nearly as wide as the interfrontal stripe; ocellar triangle rounded and black, the ocellar bristles small, scarcely reaching one fourth the length of the front. Cheeks piceous black, about one sixth the eye-height; a single vibrissa. Three dorsocentrals, acrostichals very sparse. Last segment of the abdomen rounded, not longer than the penultimate segment, the ovipositor short. No tibial bristles. Margin of the calypteres a little dusky. Wings hyaline, veins dark; third section of the costa longer than the fourth section and about one third as long as the second section; discal cell small, the posterior crossvein opposite the end of the first vein, the anterior crossvein before the middle of the discal cell; segments of the fourth vein proportioned about one to six, of the fifth vein about one to two; the fourth vein ending at the wing tip, subparallel with the third.

One specimen, Tacoma, Washington, August 27, 1912.

Structurally this species is related to *luctuosa* Meigen, from which it differs in the color of the scutellum and of the front.

***Agromyza pollinosa* new species.**

Male.—Length 2 mm. Largely black, overlaid with cinereous brown pollen. Head yellow, the occiput except laterally and below and the round ocellar triangle black. Ocellar bristles reaching three fourths the distance to the frontal suture; four to six pairs of fronto-orbitals; face strongly receding, carinate between the subantennal depressions; cheeks about one third the height of the obliquely oval and pubescent eyes; one vibrissa and three weak oral hairs. Mouth-parts yellow, palpi broad. Antennæ yellow, the third joint subreniform, the arista yellowish at its base. Pleuræ and notum subopaque, with grayish pollen; the narrow notopleural and meso-pteropleural sutures yellow; bristles long, four dorsocentrals, four rows of acrostichal setulæ. Abdomen subshining, the lateral membrane yellow; hypopygium relatively large, with two rather long, narrow lamellæ in the apical excision. Apex of the coxæ and the broad knees yellowish; middle tibiæ without extensor bristles. Halteres, calypteres and root of wing yellow; wings hyaline, narrow, the veins slender but dark; third section of costa longer than the fourth and about one fifth as long as the second section; anterior crossvein just beyond the end of the first vein and just beyond the middle of the discal cell; sections of fourth vein about one to five, of the fifth vein subequal.

Two specimens from grass sweepings gathered by Professor Wm. T. Shaw at Sitka, Alaska, July 16, 1907.

***Agromyza pacifica* new species.**

♂♀. Length 1.5-2 mm. Pale yellow, the following parts black, cinereous dusted; middle of occiput, disk of mesonotum, leaving the sides broadly and a large prescutellar spot yellow, metanotum largely, spots at base of posterior coxæ, that on the sternopleuræ large and triangular, and also the hypopygium black. The last abdominal segment of the female is short and jet black. Third antennal joint, arista except base, front of clypeus, and small irregular spots on pleuræ black or blackish. Front rather broad, quadrate, three fronto-orbitals, ocellar bristles reaching two thirds the distance to the antennæ; face not carinate; cheeks one fourth the eye-height; vibrissa longer than the sparse oral hairs. Four dorsocentrals, setulæ very sparse but long, acrostichals in two irregular rows; three mesopleural bristles present in a vertical posterior row, the center one longest. Calypteres with dusky margin and fringe. Legs less pure yellow, no tibial bristles. Centers of abdominal tergites a little dusky. Wings hyaline; third section of costa subequal to the fourth and a little more than one fourth the extent of the second section; anterior crossvein just beyond the termination of the first vein and beyond the middle of the discal cell; fourth vein ends beyond the wing tip, its sections one to six; basal section of the fifth vein somewhat shorter than the apical section.

One male, six females. Bellingham and Mount Constitution, Washington; Douglas, Alaska (E. L. Jenne).

***Agromyza varia* new species.**

Female.—Length 2 mm. Largely blackish, the following parts yellow; front, face, cheeks, occipital orbits below, proboscis, broad sides of mesonotum, sutures of pleuræ, lateral membrane of abdomen, narrow apex of penultimate abdominal segment, root of halteres and underside of anterior femora. Remainder of the body black or blackish, including the antennæ, entire arista, palpi, ocellar triangle, occiput, disk of mesonotum, scutellum except its apex, most of pleuræ, margin of calypteres, knob of halteres, the abdomen, of which the short terminal segment is jet black, and most of the legs. Front square, three strong fronto-orbitals, ocellar bristles reaching two thirds the distance to the antennæ; face rather flat, cheeks one third the eye-height; vibrissa a little longer than the five oral hairs. Four dorsocentrals, acrostichals very sparse, in two irregular rows; two mesopleural bristles and a few additional setulæ. No tibial bristles. Wings hyaline; the third section of the costa longer than the fourth and about one third as long as the second section; anterior crossvein before the end of the first vein and beyond the middle of the discal cell; fourth vein ending at the wing tip, its sections about one to seven; basal section of the fifth vein two thirds as long as the outer section; posterior crossvein equal to the penultimate section of the fourth vein; auxiliary vein ending much before the end of the first vein.

One specimen, Moscow Mountain, Idaho, June 12, 1910.

This species is structurally very close to *pacifica*, differing but slightly in the neuriation. The setulæ of the mesopleuræ are less evident in *pacifica* and the arista is less robust and more openly pubescent. The blackened knob of the halteres is unusual for this section of the genus.

***Agromyza clara* new species.**

Male.—Length 1 mm. Face, cheeks, lower occiput, lower front, antennæ, mouth-parts, halteres, legs and most of pleuræ whitish to pale yellow. Upper occiput, vertex, mesonotum except lateral margins, scutellum, metanotum except a subscutellar cinereous line, spots on sternopleuræ and hypopleuræ, and abdomen except very narrow incisures, black or blackish. Front very broad and square, with three fronto-orbitals; the ocellar bristles reaching about one third the distance to the antennæ; face greatly receding, nearly flat; antennæ porrect rather than decumbent; cheeks about one half the eye-height, a single vibrissa and a single oral hair present. Apparently three dorsocentrals present, acrostichals very sparse; pleuræ not setulose. Calypteres with dusky margin and fringe. Tarsi a little darkened; no tibial bristles. Wings hyaline, veins rather strong and dark; third section of costa equal to fourth and about one fourth the length of the second section; discal cell small, the anterior crossvein before the end of the first vein, and beyond the middle of the discal cell; fourth vein ending at wing tip, its segments about one to ten; basal section of fifth vein but little more than one half the length of the distal section.

One specimen, Mount Constitution, Orcas Island, Washington, July 31, 1908.

***Agromyza lima* new species.**

Male.—Length 1.5 mm. Yellow and black in color, the following parts of the body are pale yellow; head, except center of occiput, most of pleuræ, sides of mesonotum, most of scutellum, incisures of abdomen, antennæ, mouth-parts, halteres, calypteres, root of wings, and most of legs. The following parts of the body are black and more or less overlaid with grayish pollen; small ocellar triangle, occiput except orbits, a humeral spot, disk of mesonotum extending to the scutellum and scarcely notched along the sides, spot in meso- and sternopleuræ, the last-mentioned largest; basal angles of scutellum, metathorax largely, and abdomen mostly, except narrow incisures and broader sides of the segments; the hypopygium is also black. Front slightly longer than broad and narrower toward the antennæ; three or four small fronto-orbitals; ocellar bristles reaching about one third the length of the front. Antennæ reaching half way to the epistome, the arista two times the length of the third joint, its base yellowish. Face moderately carinate; cheeks nearly as deep as the eye-height; vibrissæ not longer than the four or five oral hairs. Two dorso-centrals, no setulæ; meso- and sternopleuræ bare except for the single small

bristle on each. Femora pale yellow, tibiæ and tarsi testaceous, no tibial bristles. Wings hyaline, veins dull yellowish; the third section of the costa subequal to the fourth and one fourth the length of the second section; the fourth vein ends at the wing tip, its sections about one to six; discal cell small, the anterior crossvein before its middle and before the end of the auxiliary vein, the posterior crossvein just beyond the end of the first vein and shorter than the second section of the discal cell; basal section of the fifth vein one half as long as the outer section.

Female.—Slightly larger, about 2 mm. in length. The abdomen is blacker, the incisures scarcely yellow, except the apical margin of the penultimate segment; the ultimate segment is jet black, cylindrico-conical, about as long as two of the middle segments together, the ovipositor short, tubular.

Three males and four females, Moscow Mountain, Idaho, July, 1911 and 1912.

Liriomyza tubifer new species.

Female.—Length 2 mm. Shining yellow except the following parts black: occiput except the lower orbits and oral portion, small ocellar spot, center of mesonotum broadly but with narrow incisions above the humeri, at the suture and in back on the intra-alar stripe, and with a broad quadrate emargination before the scutellum (laterally and posteriorly the mesonotum is yellow), small black spots on humeri, notopleural suture, mesopleuræ below and above hind coxæ, and a large triangular black spot on the sternopleuræ, also the metanotum and the large ovipositor black. The abdomen is yellowish, with broad brown fasciæ on the middle of the segments. Front very little longer than wide, with four fronto-orbitals, the upper one reclinate and distant from the lower converging smaller three; ocellar bristles extending down one third the length of the front. Antennæ not reaching the epistome, the arista coarse and black. Mouth-parts yellow. The vibrissa scarcely differentiated from the row of five oral hairs. Two dorsocentrals; about six rows of fine acrostichals; one presutural. The last abdominal segment as long as the preceding three, compressed near the base, the cylindrical ovipositor projecting. Coxæ and femora pale yellow, the tibiæ and tarsi blackish; no tibial bristles. Halteres yellow; calypteres with dark fringe. Wings hyaline; the third section of the costa two thirds as long as the fourth section and about one sixth as long as the second section; the anterior crossvein before the end of the first vein and at the middle of the small discal cell; the sections of the fourth vein proportioned one to seven, of the fifth vein two to three; posterior crossvein oblique, opposite the end of the first vein and shorter than the front sections of the discal cell.

One specimen, Hayti.

The genus *Liriomyza*, established by Mik for a species with long ovipositor, is hardly tenable. The present species, aside from the ovi-

positor, would be considered merely a color variation of *Agromyza melampyga*. It is doubtful if the males would offer structural differences from ordinary *Agromyzas*, and, moreover, the length of the ovipositor and of the last abdominal segment of the female is a variable character among the several species.

NOTES ON SOME SPECIES OF *Agromyza*.

***Agromyza curvipalpis* Zetterstedt.** The European specimens I possess have the veins thinner than in the majority of the American specimens. One male from Woods Hole, Massachusetts, is larger, the head a little sturdier and the lateral shining stripes of the front are narrower than usual, including the orbits from the eyes to the frontal bristles. Usually the frontal bristles are located upon the brightest part of the shining stripes. Various authors mention the porrect curved palpi of the male. In all my males the palpi are not especially conspicuous. The females are separable from *maura* with great difficulty. The best character seems to be the relative denseness of the pubescence on the frontal orbits. In *maura* these hairs grow dense and are easily seen under a high magnification.

***Agromyza dimidiata* Walker.** This species was described as a *Phytomyza*, but was thought by Coquillett to be the same as *trifolii*, which is *scutellata*. The brief description makes identification impossible.

***Agromyza invaria* Walker** is unrecognizable from the description.

***Agromyza lacteipennis* Fallen.** This European species was reported by Coquillett as occurring in Alaska. It belongs to the Mili-chiine genus *Meoneura*, as has already been noticed by Hendel,¹ and is specifically the same as *vagans* Fallen. It is of common occurrence in the northwest.

***Agromyza neptis* Loew** might be confused with *parvicornis* Loew, which it greatly resembles. *Neptis* has the wings more slender, with the front and hind borders more nearly parallel and the veins darker; the marginal cell is about four times as long as the submarginal along the costa; in *parvicornis* it is about three times as long. The veins at the base of the wing are dusky and not yellowish. The arista is scarcely twice as long as the antennæ and is microscopically pubescent.

¹ Wiener entomologische Zeitung, XXX, 35 (1911).

Agromyza parvicornis Loew. The veins are usually yellowish, especially pronounced on the basal half of the wing. The arista is visibly pubescent and fully two and one half times as long as the antenna. See note under *neptis*.

Agromyza sorosis Williston. I have a specimen received from Dr. Williston's collection, from Piedro Blanca, Bolivia, April, which has the pubescence of the arista more distinct than in the specimens from the states.

Agromyza sulphuriceps Strobl. Although I have no European material for comparison, I place six specimens from Troy, Idaho, and Kamiac Butte, Washington, in this species. They agree so thoroughly with Professor Strobl's description that it would add nothing to the knowledge of this genus to bestow a new name on these flies. The species is apparently very close to *varifrons* Coquillett, and possibly is the same. The differences given in the table, all that is tangible in the descriptions, are probably more apparent on paper than real in nature.

Agromyza tæniola Coquillett. This may be a variation of *grossicornis*. Coquillett's type from California has three dorsocentrals, the third antennal joint very small and the mesonotum not pruinose. I have specimens that agree in other particulars with the description of *tæniola*, but have four dorsocentrals of varying size, and the mesonotum lightly pollinose.

Agromyza tiliæ Couden. This species was described from material reared from stem galls of the American linden. It is very close to *simplex* according to Coquillett and Couden, the only discernible differences being the position of the frontal bristles and the shape of the ocellar triangle. As both of these characters are quite variable in other species of this genus, the form *tiliæ* may be included with *simplex* as variations of the broad species *maura*. The shining frontal triangle is large, elongate and has its sides concave; the lower four frontal bristles are close together and well separated from the upper bristle. The two sections of the fifth vein are equal, as in *simplex*, but the space between the crossveins is greater, ranging from one half to nearly the length of the posterior crossvein. I have a specimen presumably belonging here, from Montreal Island, Quebec, received from G. Chagnon. The lower frontal bristles, however, are not so crowded as pictured for *tiliæ*. The specimen has the frontal

lunule cinereous, differing in this respect from the other specimens of *maura*. The face is receding and slightly carinate, and the tip of the abdomen is bronzed.

Agromyza tritici Fitch. Length 2 mm. Black, the lower part of the front and the oral margin yellowish; legs blackish; knees yellow; fourth vein evanescent beyond the small discal cell. New York. The description is too brief to place this species in the table. It suggests *Mconeura* or *Napomyza* rather than *Agromyza*. The figure shows the costa stopping at the third vein.

TABLE OF THE SPECIES OF *Phytomyza*.

- Front narrow; third antennal joint ending in a point, as in *Cerodonta*; third vein ending far before the tip of the wing. (Eur.; Wash.*)
- acuticornis* Loew.
- Front normally broad; the third antennal joint not pointed.....2.
2. Front principally black or cinereous; antennæ black.....3.
- Front and cheeks largely yellow.....11.
3. Abdomen yellow, except the tip; thorax and legs opaque cinereous black; mesonotum densely hairy between the bristles. (N. Y.*)
- bicolor* Coquillett.
- Abdomen mostly black (sometimes the incisures narrowly yellow); mesonotum not densely hairy4.
4. Frontal orbits whitish, contrasting with the brownish central portion of the front; anterior dorsocentrals small; cheeks one-sixth the eye-height; arista slender. (Id.,* Wash.*).....*orbitalis* n. sp.
- Front blackish, the orbits concolorous; four dorsocentrals.....5.
5. Frontal orbits, thorax and abdomen shining; wings nearly hyaline.....6.
- Frontal orbits opaque; thorax more or less dusted; four fronto-orbitals. (*obscura* Fallén.)7.
6. Entirely black, except the halteres and proboscis; veins blackish up to the base; three fronto-orbitals; fringe of calypteres black; third antennal joint shorter than deep. (N. Y.,* Id.*).....*nitida* n. sp.
- Legs partly fuscous; base of wings and notopleural suture yellowish; four fronto-orbitals; fringe of calypteres yellow; third antennal joint longer than deep. (D. C., Ont.*).....*clematidis* Loew.
7. Wings lightly clouded, especially in front; mesonotum subshining; cheeks fuscous. (Eur.; Wash.*)...*obscura* var. *nigripennis* Zetterstedt.
- Wings not with fuscous tinge, the marginal cell not brownish.....8.
8. Cheeks black; abdomen and legs generally black.....9.
- Cheeks brown; sides of abdomen, some of the incisures, and the knees generally yellowish10.
9. Knees paler; second section of the costa four times longer than the third

section, the third vein ending a little in front of the tip of the wing; abdomen subopaque. (Eur.;* Greenl., Cal., Id.,* Wash.*)

obscurella Fallen, sens. str.

Legs black; the second section of the costa about three times longer than the third section, the third vein ending much before the tip of the wing; abdomen more shining. (Eur.;* Greenl., Id.,* Wash.*)

obscurella var. *nigritella* Zetterstedt.

10. Thorax opaque, cinereous dusted, with a faint yellowish humeral spot. (D. C., Mass., Cal., Ore., Wash.,* Alaska.)

obscurella var. *ilicicola* Loew.

Thorax subshining, slightly dusted, no humeral spot. (Eur.;* Id.,* Wash.,* Alaska.*) *obscurella* var. *nigra* Meigen.

11. Antennæ yellow, the third joint sometimes infuscated.....12.

Antennæ black, or at least the third joint entirely black.....14.

12. Cheeks broader than the eye-height; the third antennal joint elongate-oval; pleuræ and legs yellow. (Ill.*).....*genalis* n. sp.

Cheeks narrower than the eye-height; the third antennal joint short-rounded13.

13. Third antennal joint bluntly rounded, pubescent and dusky; pleuræ, abdomen and legs yellow. (Eur.; Ind.*).....*analis* Zetterstedt.

Third antennal joint minute and bare; pleuræ, abdomen and legs black, but variegated with yellow. (Eur.;* Ohio, Ill., Alaska.)

flavicornis Zetterstedt.

14. Femora in part at least yellowish; base of antennæ yellow; lateral margins of thorax at least broadly yellow.....15.

Femora black, except the knees; antennæ entirely black or dark brown; blackish species19.

15. Wings dark, veins blackish; scutellum cinereous black; opaque black species. (D. C.).....*nervosa* Loew.

Wings hyaline; scutellum yellow, or at least usually yellow in the middle; species often yellow16.

16. Body subshining; mesonotum marked with four brown vittæ, the middle pair scarcely extending beyond its middle. (Tex.)

clemativora Coquillett.

Body opaque dusted; mesonotum marked with cinereous black. (*flava* Fallen.)17.

17. Pleuræ, abdomen and legs largely yellow18.

Pleuræ, abdomen and legs largely black. (Eur.;* Greenl.)

flava var. *zetterstedti* Schiner.

18. Pleuræ, except part of the sternopleura, yellow; abdomen yellow; mesonotum with two narrow yellow vittæ dividing the dark color into three parts. (Eur.;* Wash.*).....*flava* Fallen sens. str.

Pleuræ with the dark color more extended; abdomen sometimes dusky in part; yellow stripes of the mesonotum not evident. (Eur.;* Id.,* Ore.*).....*flava* var. *flavoscutellata* Fallen.

19. Sides of thorax and the humeri broadly yellow. (Eur.;* Id.,* Wash.*)
bipunctata Loew.
 Notopleural suture narrowly yellow, humeri not yellow.....20.
20. Mesonotum, pleuræ and abdomen subshining; bristles fine; arista short-pubescent. (Eur.; Conn.,* D. C., Ill.,* Id.*).....*aquilegia* Hardy.
 Notum and pleuræ opaque cinereous black; bristles coarse.....21.
21. Arista much thickened and closely pubescent; usually three fronto-orbitals. (Eur.; Id.,* Wash.*).....*crassiseta* Zetterstedt.
 Arista slender, as usual22.
22. Acrostichals present; ovipositor longer than the last abdominal segment.23.
 Acrostichals absent; ovipositor shorter than the last segment; incisures yellow. (N. Y., Mass.,* Conn., Pa., N. J., B. C.*).....*chrysanthemii* Kowarz.
23. Incisures of the abdomen conspicuously yellow. (Eur.;* Greenl., Id.)*
 (*solita* Walker?)*affinis* Fallen.
 Incisures not yellow, only the last segment banded. (Eur.;* Mass., N. Y., D. C., Ont., Id.,* Ore.,* Wash.,* Cal.)* (*genualis* Loew.)
albiceps Meigen.

Phytomyza orbitalis new species.

♂♀. Length 1.5 mm. Black, with a slight brownish tinge, lightly dusted. Frontal orbits marked with a yellow stripe bearing the bristles. Proboscis, notopleural suture broadly, humeri, some of the abdominal incisures narrowly, knees, tarsi and root of wings more or less dark brownish. Humeral callus sometimes yellowish. Halteres whitish yellow. Four fronto-orbitals; center of front opaque, but sometimes brownish; cheeks one sixth the eye-height; vibrissa not much stronger than the oral hairs; third joint of antennæ rounded-ovate, scarcely pubescent, the arista microscopically pubescent, two times the length of the third antennal joint. Five dorsocentrals, of which one is pre-sutural, but the anterior three weak and scarcely differentiated from the setulæ; four scattered rows of acrostichals; two sternopleurals, the large mesopleural near the top of the row. Last abdominal segment short, conical. Fringe of calypteres dusky; wings nearly hyaline, the fourth vein nearly straight, ending beyond the wing tip, the third section of the costa but little shorter than the following section.

Twenty-two specimens, from Collins, Troy and Moscow Mountain, Idaho, and from Pullman, Kamiac Butte and Oroville, Washington; May to August, but most of the specimens taken in June.

The species is structurally very much like *obscurcella* Fallen. The arista, however, is more slender and less perceptibly pubescent, the cheeks are narrower and the dorsocentrals are less pronounced.

Phytomyza nitida new species.

♂♀. Length 1.3 mm. Black, rather shining, the proboscis, halteres and root of wing whitish. Two or three fronto-orbitals; the vibrissa no longer

than the oral hairs. Eyes large, leaving the cheeks about one fourth the eye-height. Third joint of antennæ orbicular, not hairy, the arista about twice the length of the third joint. Four small dorsocentrals, the acrostichals minute; one fine mesopleural and one sternopleural bristle, no setulæ. Terminal segment of abdomen of female short. Calypteres with dusky margin and fringe. Wings lightly infumated, the fourth vein ending at the wing tip or just beyond, the fourth section of the costal margin about twice as long as the third.

Five specimens from the Cedar Mountains of Idaho, taken at Troy, Bovill and Moscow; and one from White Plains, New York, the last mentioned specimen collected by J. R. de la Torre Bueno.

This species is apparently close to *morio* Zetterstedt, but the wings are not white. It differs from the related *obscurella* Fallen and *orbitalis* n. sp. in having three fronto-orbitals, the dorsocentrals and especially the acrostichal and other setulæ weak, and the pollinosity greatly reduced.

Phytomyza genalis new species.

♂♀. Length 2.5 mm. Robust, yellow, the ocellar triangle, occipital spot, disk of mesonotum, the scutellum and metanotum, a fainter spot above the posterior coxæ, and in the female the bases of the abdominal segments, cinereous black; ovipositor and apical half of preceding segment shining jet black. Eyes small, rounded-oval, the front and cheeks broad, the latter comprised largely of the obliquely descending genæ: four fronto-orbitals; vibrissa small. Antennæ yellow, elongate, the third joint one half longer than deep, nearly bare, the black, bare arista two and one half times as long as the third joint. Mouth-parts yellow. Four long dorsocentrals, two rows of sparse acrostichals, one long mesopleural. Tarsi a little dusky. Halteres yellow. Calypteres with a dense dusky fringe. Wings brownish hyaline, root of first vein yellow, the fourth vein straight, ending just beyond the wing tip.

Two specimens, Chicago, Illinois.

The species resembles *analisis* Zetterstedt, but has much smaller eyes, longer antennæ, dark scutellum, and in the female a fasciate abdomen.

NAPOMYZA Haliday.

Anterior crossvein at two thirds the length of the small discal cell, the last section of the fifth vein about five times as long as the preceding section2.
 Discal cell minute, the posterior crossvein nearly opposite the anterior; ultimate section of the fifth vein eight or more times as long as the preceding section3.

2. Four dorsocentrals; thorax opaque gray pruinose; head largely black; legs black, except the knees. (Alaska.) (*Agromyza*.) *parvicella* Coquillett.¹
Dorsocentrals weak, thorax somewhat subshining, the sides broadly yellow; head yellow except the occiput; anterior tibiæ and tarsi yellowish. (Id.)* *plagiata* sp. nov.
3. Posterior crossvein in front of the anterior crossvein; ovipositor depressed; opaque black species with fuscous head, pale knees, notopleural stripe and incisures of abdomen. (Eur., Id.,* Wash.)..... *anomala* Strobl.
Posterior crossvein opposite the anterior crossvein; ovipositor compressed; mostly cinereous black, the head yellowish. (Eur.;* N. H., Ill., Mo., Col.,* Alaska.) *lateralis* Fallen.

Napomyza plagiata new species.

Female.—Length 2.5 mm. Robust, opaque blackish, the front, face, cheeks, lower occipital orbits, proboscis, broad sides of the mesonotum, parts of the pleuræ, narrow apical margins of the first, second and fifth abdominal segments, root of wings, calypteres, knees, anterior tibiæ and the tarsi yellowish; knob of halteres whitish. Front broad, a little dusky towards the antennæ, four fronto-orbital bristles; antennæ brown, the third joint round, with short pubescence, arista blackish, two times as long as the third joint, minutely pubescent. Cheeks at the middle one fifth as deep as the eye-height, the vibrissæ not larger than the oral hairs. Anterior dorsocentrals scarcely larger than the adjacent setulæ, acrostichals in four very irregular rows; one sternopleural and one mesopleural bristle. Last segment of the abdomen transverse and polished, the ovipositor short, broad, depressed and deeply scabrous. margin and fringe of calypteres dusky. Wings nearly hyaline, veins brown, the fourth vein ending just beyond the wing tip, its sections about one to twenty, the sections of the fifth vein proportioned about one to five, the anterior crossvein at two thirds the length of the discal cell.

One specimen, Avon, Idaho, July 26, 1912.

(Continued in the December number.)

MISCELLANEOUS NOTES.

Drosophila repleta Woll.—This strikingly colored fly, better known in America as *D. punctulata* Loew, has an extended tropical and sub-tropical distribution and has even been taken in New York City. Specimens recently determined through the kindness of Professor J. M. Aldrich, Moscow, Idaho, show that this species was taken in Albany in September and October, 1908, and also reared the preceding

¹ *Agromyza tritici* Fitch is apparently closely related.